Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 290

Proceedings of the Fortieth Annual Meeting of the

Pennsylvania State Board of Agriculture

ALSO

PROCEEDINGS OF THE JOINT MEETINGS ALLIED AGRICULTURAL ASSOCIATIONS

HELD IN

CHESTNUT STREET HALL

AND THE

BOARD OF TRADE BUILDING, HARRISBURG, PA.

JANUARY 23 and 24, 1917

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MEMBERS

OF THE

Pennsylvania State Board of Agriculture

For the Year 1917.

Members Ex-officio

HON. MARTIN G. BRUMBAUGH, Governor.
HON. HENRY HOUCK, Secretary of Internal Affairs.
DR. N. C. SCHAEFFER, Superintendent of Public Instruction.
DR. EDWIN ERLE SPARKS, President of the State College.
HON. A. W. POWELL, Auditor General.
HON. CHARLES E. PATTON, Secretary of Agriculture.

Appointed by the Governor

Term expires.

Robert J. Walton, Hummelstown, Dauphin County,.....Term expires 1918
Charles F. Jenkins, Philadelphia,.....Term expires 1919
Cloyd B. Ewing, Mount Union, Huntingdon County,.....Term expires 1920

Appointed by the Pennsylvania State Poultry Society

W. Theo. Wittman,.....Allentown,.....1920

Appointed by the Pennsylvania Bee-Keepers' Association

E. A. Weimer,.....Lebanon, ...1918

Elected by County Agricultural Societies

Adams, ...	A. I. Weidner, ...	Arendtsville, ...	1918
Allegheny, ...	C. L. Hood.....	Coraopolis, R. D.,.....	1918
Armstrong, ...	S. S. Blyholder.....	Kelly Station, ...	1920
Beaver, ...	Walter C. Dunlap,....	West Bridgewater, ...	1920
Bedford, ...	Wm. F. Biddle,.....	Lutzville, R. D. 1,.....	1918
Berks, ...	H. G. McGowan,.....	Geiger's Mills, ...	1919
Blair, ...	W. Frank Beck,.....	Altoona, ...	1920
Bradford, ...	Louis Piollet,.....	Wysox, ...	1919
Bucks, ...	B. Frank Wambold,....	Sellersville, ...	1920
Butler, ...	Geo. A. Bicker, ...	Cabot, ...	1920
Cambria, ...	L. J. Bearer,.....	Hastings, ...	1919
Cameron,.....	R. P. Heilman,.....	Emporium, ...	1919
Carbon, ...	Edward Lienhard, ...	Mauch Chunk, ...	1920

Elected by County Agricultural Societies—Continued.

			Term expires.
Centre,	John A. Woodward,	Howard,	1918
Chester,	M. E. Conard,	Westgrove,	1918
Clarion,	J. H. Wilson,	Clarion,	1919
Clearfield,	T. L. Way,	Curwensville,	1919
Clinton,	Joel A. Herr,	Millhall,	1917
Columbia,	A. C. Creasy,	Bloomsburg, R. D.,	1919
Crawford,	W. F. Throop,	Espyville,	1918
Cumberland,			
Dauphin,	E. S. Keiper,	Middletown,	1920
Delaware,	Thos. H. Wittkorn,	Media,	1920
Elk,	John G. Schmidt,	St. Marys,	1919
Erie,	D. Warren De Rosay,	Corry,	1919
Fayette,	John T. Smith,	Dunbar,	1919
Forest,			
Franklin,	J. P. Young,	Marion,	1920
Fulton,	Frank Ranck,	Hancock, Md.,	1919
Greene,			
Huntingdon,	George G. Hutchison,	Warrior's Mark,	1918
Indiana,	S. C. George,	West Lebanon,	1919
Jefferson,	Peter B. Cowan,	Brookville,	1919
Juniata,	Matthew Rodgers,	Mexico,	1918
Lackawanna,	Horace Seamans,	Factoryville,	1919
Lancaster,	J. Aldus Herr,	Lancaster,	1920
Lawrence,	Doris L. Fulkman,	New Wilmington,	1919
Lebanon,	Edward Shuey,	Annville, R. D. 2,	1919
Lehigh,	P. S. Fenstermacher,	Allentown,	1918
Luzerne,	J. E. Hildebrant,	Dallas,	1918
Lycoming,	B. F. Kahler,	Hughesville,	1918
McKean,	E. A. Studholme,	Smethport,	1919
Mercer,	W. C. Black,	Mercer,	1920
Mifflin,	C. M. Smith,	Lewistown,	1919
Monroe,	F. S. Brong,	Saylorsburg,	1919
Montgomery,	John H. Schultz,	Norristown,	1920
Montour,	J. Miles Derr,	Milton, R. D.,	1919
Northampton,	C. S. Messinger,	Tatamy,	1918
Northumberland,	Wm. A. Fisher,	Milton, R. D.	1919
Perry,	Clark M. Bower,	Blain,	1919
Philadelphia,	David Rust,	Philadelphia,	1919
Pike,	B. F. Killam,	Paupack,	1918
Potter,			
Schuylkill,	John Shoener,	Orwigsburg,	1919
Snyder,			
Somerset,	Robert W. Lohr,	Boswell,	1920
Sullivan,	G. Eugene Bown,	Forksville,	1918
Susquehanna,	Dr. E. E. Tower,	Hallstead,	1919
Tioga,	C. H. DeWitt,	Mansfield,	1920
Union,	J. Newton Glover,	Vicksburg,	1920
Venango,	Joseph McElhany, Jr.,	Franklin,	1918
Warren,	R. J. Weld,	Sugargrove,	1920
Washington,	Jas. M. Paxton,	Houston,	1920
Wayne,	W. E. Perham,	Varden,	1920
Westmoreland,	W. F. Holtzer,	Greensburg,	1919
Wyoming,	G. A. Benson,	Tunkhannock,	1919
York,	Geo. F. Barnes,	Rossville,	1920

OFFICERS

President

Hon. Martin G. Brumbaugh, ... Harrisburg.

Vice Presidents

Louis Piollet, ... Wysox.
John Shoener, ... Orwigsburg.
Dr. E. E. Tower, ... Hallstead.

Executive Committee

S. S. Blyholder, ... Kelly Station.
Dr. M. E. Conard, ... West Chester.
Hon. H. G. McGowan, ... Geiger's Mills.
W. Frank Beck, ... Altoona.
J. P. Young, ... Marion.
Matthew Rodgers, ... Mexico.
P. S. Fenstermacher, ... Allentown.
C. M. Bower, ... Blain.
Hon. Charles E. Patton, Secretary, Ex-offiicio, ... Harrisburg.

Members of Advisory Committee

John P. Young, ... Marion.
Clark M. Bower, ... Blain.
W. Frank Beck, ... Altoona.

Legislative Committee

H. G. McGowan, ... Geiger's Mills.
R. W. Lohr, ... Boswell, R. D. 1.
Geo. G. Hutchison, ... Warrior's Mark.
Matthew Rodgers, ... Mexico.
P. S. Fenstermacher, ... Allentown.

Committee on Resolutions

John A. Woodward, ... Howard.
B. Frank Wambold, ... Sellersville.
B. F. Killam, ... Paupack.
W. C. Black, ... Mercer.
J. Aldus Herr, ... Lancaster, R. D.

Memorial Committee

J. Miles Derr, ... Milton, R. D.
E. A. Studholme, ... Smethport.
S. C. George, ... West Lebanon.

Consulting Specialists

Botanist, ...	Prof. F. D. Kern, ...	State College.
Pomologist, ...	Chester J. Tyson, ...	Floradale.
Chemist, ...	Dr. William Frear, ...	State College.
Vet. Surgeon, ...	Dr. C. J. Marshall, ...	Harrisburg.
Sanitarian, ...	Dr. W. Frank Beck, ...	Altoona.
Microscopist and Hygienist,	Prof. J. W. Kellogg, ...	Harrisburg.
Entomologist, ...	Prof. J. G. Sanders, ...	Harrisburg.
Ornithologist, ...	Prof. Boyd P. Rothrock, ...	Harrisburg.
Meterologist, ...	Prof. W. G. Owens, ...	Lewisburg.
Apiarist, ...	H. C. Klinger, ...	Liverpool.
Economic Geologist, ...	Prof. Baird Halberstadt, ...	Pottsville.
Agricultural Geologist, ...	W. H. Stout, ...	Pinegrove.
Forests and Forestry, ...	Irvin C. Williams, ...	Harrisburg.
Feeding Stuffs, ...	G. G. Hutchison, ...	Warrior's Mark.
Soils and Crops, ...	Prof. Franklin Menges, ...	York.

STANDING COMMITTEES

Cereals and Cereal Crops

John P. Young, ... Marion.

Construction and Maintenance of Earth Roads.

George F. Barnes, ... Rossville.

Fruit and Fruit Culture

A. I. Weidner, ... Arendtsville.

Dairy and Dairy Products

Dr. M. E. Conard, ... Westgrove.

Fertilizers

Jchn H. Schultz, ... Norristown.

Wool and Textile Fibers

W. C. Black, ... Mercer.

Livestock

James M. Paxton, ... Houston.

Poultry

W. Theo. Wittman, ... Allentown.

Marketing

J. Aldus Herr, ... Lancaster, R. D.

Proceedings of the Fortieth Annual Meeting of the State Board of Agriculture, Held in Market Street Hall, Harrisburg, Pa., January 23 and 24, 1917.

Harrisburg, Pa., January 23, 9 A. M.

Vice President S. S. Blyholder in the chair.

The CHAIRMAN: I suppose it is not necessary to tell you that I am not Martin G. Brumbaugh. He was to call the meeting to order, but he is not here, so we will proceed with the order of business. First, will be the roll-call.

The roll of members was then called by Assistant-Secretary Conard, and at this and subsequent roll-calls the following members were found to be present: Hon. Martin G. Brumbaugh, Dr. N. C. Schaeffer, Dr. Edwin Erle Sparks, Hon. Charles E. Patton, W. Theo. Wittman, E. A. Weimer, A. I. Weidner, C. L. Hood, S. S. Blyholder, Wm. F. Biddle, H. G. McGowan, W. Frank Beck, Louis Piollet, B. Frank Wambold, L. J. Bearer, R. P. Heilman, Edward Lienhard, John A. Woodward, M. E. Conard, J. H. Wilson, T. L. Way, A. C. Creasy, W. F. Throop, E. S. Keiper, Thos. H. Wittkorn, John G. Schmidt, D. Warren De Rosay, John T. Smith, John P. Young, Frank Ranck, Geo. G. Hutchison, S. C. George, Peter B. Cowan, Matthew Rodgers, Horace Seamans, J. Aldus Herr, Doris L. Fulkman, Edward Shuey, P. S. Fenstermacher, J. E. Hildebrant, B. F. Kahler, E. A. Studholme, W. C. Black, C. M. Smith, John H. Schultz, J. Miles Derr, C. S. Messinger, Wm. A. Fisher, Clark M. Bower, David Rust, B. F. Killam, John Shoener, R. W. Lohr, G. Eugene Bown, Dr. E. E. Tower, J. Newton Glover, Jos. McElhaney, Jr., Jas. Paxton, W. E. Perham, W. F. Holtzer, G. A. Benson and G. F. Barnes.

The following Consulting Specialists were present: Prof. F. D. Kern, Chester J. Tyson, Dr. Wm. Frear, Dr. C. J. Marshall, Prof. J. W. Kellogg, Prof. J. G. Sanders, Prof. W. G. Owens, H. C. Klinger, Prof. Baird Halberstadt, W. H. Stout, Irwin C. Williams and Prof. Franklin Menges.

The CHAIRMAN: Next will be the reading of the minutes of the last meeting.

Assistant-Secretary Conard then read the minutes of the Spring meeting, held at Reading, Pa.

The CHAIRMAN: You have heard the minutes. What is your pleasure?

MR. HUTCHISON: I move that the minutes be adopted as read.

The motion was seconded and carried.

The CHAIRMAN: Next on the program is the appointment of the Committee on Credentials. I will appoint, as that Committee, Matthew Rodgers, Chairman; B. F. Killam, A. I. Weidner, W. F. Holtzer and R. P. Heilman. Any persons present having credentials

will present them to the Chairman of the Committee, Mr. Matthew Rodgers. If there are any members present from any other society, please pass your names to this Committee. We will wait a few minutes for you to pass up the credentials.

(Short recess.)

The CHAIRMAN: We are now ready to proceed with the stated program, Reports of Standing Committees and Specialists. The first is Report of Committee on Cereals and Cereal Crops, by J. Aldus Herr, of Lancaster, Chairman.

Mr. Herr presented the following report:

REPORT OF COMMITTEE ON CEREALS AND CEREAL CROPS FOR 1916

By J. ALDUS HERR, *Chairman.*

It has been the annual custom to give reports of the several crops grown in the State; but as statistics are rather dry facts, I will excuse the audience if they slumber while I present this report.

The five great cereal crops produced in Pennsylvania during 1916 were worth, to the farmers, $113,487,884. Wheat alone showed an increase in production over the 1915 crop; corn and rye production was slightly below last year, and there was a marked decrease in oats and buckwheat crops. Despite the shortage in bushels for the past season, the total value of the crops was much higher than the 1915 crop, which was valued at $95,932,420, this being an increase in total value over 1915 of $17,555,264.

Wheat.

Estimated area harvested, 1916, 1,333,540 acres; average yield per acre, 18 8-10 bushels; total estimated production, 25,070,500 bushels; average price per bushel, $1.46; total estimated value of crop, $36,602,930.00.

Corn.

The estimated area harvested, 1,461,120 acres; average yield per acre (shelled), 37 bushels; total estimated production, 54,061,400 bushels; average price per bushel, 92 cents; total estimated value of crop, $49,736,488.00.

A little information relative to a few of the southeastern counties might be of some interest. Lancaster county leads in total production as well as in yield per acre of corn, the corn crop being 5,233,000 bushels with a average yield per acre of 65 bushels. York county is second with an average of 60 bushels and a yield of 4,715,820 bushels; Berks county showed an average of 51 bushels and a yield of 2,935,968

bushels, while Chester county showed an average of 57 bushels and a yield of 2,842,305 bushels. Franklin county has an average of 50 and a total production 2,949,000 bushels, and Adams county an average of 51 and a production of 2,255,181 bushels; Bucks county had an average of 48 and a production of 2,302,512 bushels; Cumberland county an average of 48 and a total yield of 2,132,488 bushels. The eight mentioned counties produced over 25,000,000 bushels, or nearly half the total production of the State.

Rye.

The estimated area harvested, 266,000 acres; average yield per acre, 16.9 bushels; total estimated production, 4,495,400 bushels; average price per bushel, $1.04; total estimated value of crop, $4,675,-216.00.

Oats.

Estimated area harvested, 1,050,680 acres; average yield per acre, 31 bushels; total estimated production, 32,571,000 bushels; average price per bushel, 55 cents; total estimated value of crop, $17,914,-050.00.

Buckwheat.

Estimated area harvested, 279,970 acres; average yield per acre, 16 bushels; total estimated production, 4,480,000 bushels; average price per bushel, $1.04 bushel; total estimated value of crop, $4,659,200.00.

Potatoes.

Estimated area harvested, 265,000 acres; average yield per acre, 70 bushels; total estimated production, 18,564,000 bushels; average price per bushel, $1.30 bushel; total estimated value of crop, $24,133,200.00.

Hay.

Estimated area harvested, 3,195,900 acres; average yield per acre, 1.64 tons; total estimated production, 5,241,270 tons; average price per ton, $14.50; total estimated value of crop, $75,998,415.00.

Summary of Report.

The corn crop has fallen 730,000 bushels below 1915 yield, there being nearly 51,000 acres less planted, owing to lateness of season and farmers not being able to get the crop planted early enough to have time sufficient to mature. Much of this fact is due to the scarcity of farm laborers and a very large portion to the farmer himself not beginning soon enough so to be ready to plant when conditions present themselves.

We find these same conditions relative to the potato yield, it being far below normal, yet there were some farmers who had fine crops practically under the same conditions proving that much of the difficulty is with the individual man.

Wheat alone showed an increase in production over 1915 crop, the average production per acre being 18.8 bushels. This is far below the possible production. If better methods were followed it would be more profitable to increase the production per acre than to grow additional acreage.

The hay crop ranks first in value, nearly $76,000,000, and much of the land devoted to grass practically receives little attention. This one fact is very detrimental to agriculture; instead of increasing fertility, the soil is depleted. Can it be possible that we farmers as a unit do not practice a better system of agriculture.

MR. HUTCHISON: I move that the report be received and published in the annual report.

Motion seconded.

MR. FENSTERMACHER: I notice 10 minutes is allowed for discussion and I shall consume about one minute. I do not know, fellow-members, how it is in your sections, but with the general rise in the prices of cereals, I have noticed that our buyers, our millers and our dealers were generally about 25 cents per bushel below Chicago quotations on all kinds of grain. Now what can be done about it? It almost pays to ship from Pennsylvania to Chicago. Just think of it. I never heard of such a thing before.

MR. HUTCHISON: Is that not the quotation for futures?

MR. FENSTERMACHER: No, sir, rye, quoted at $1.50, has been selling at our place for $1.15 or $1.20; and wheat, quoted in Chicago at $1.95, has been selling at $1.60 or $1.70; potatoes and corn are also higher there than with us. I know of one reason—the millers in our section all belong to an Association called the Delaware Valley Millers' Association; all have the same price; you can guess the rest.

MR. HUTCHISON: It is with great pleasure that I listened to the report; but the Lancaster county people and the eastern people who grow great crops of corn swell themselves up and make comparisons with the rest of the State, and this is not fair on the corn question to Pennsylvania farmers. We are in different zones in this State, different climatic conditions exist. You take the eastern counties and they are given to growing corn, and if you take the seed into central Pennsylvania, it will not mature. There are large varieties of corn. We are in another zone in central Pennsylvania, and the northern tier of counties have to grow the small, yellow corn, and I don't like to see the Lancaster county people swell their chests so when they make that comparison between themselves and the western and other sections growing different corn. You will see it at the corn show and we would like to see these comparisons made so that these eastern people will not have so much over us in comparisons in production. The farmers down there that feed cattle feed two lots each year and there is a good example. I want to commend that to the farmers of the State, and their tillage is better, their German

boys and girls are staying on the farm and that is to their advantage, where our boys go off into the shops and mills and factories and we do not have the labor. These things all enter into this production question throughout Pennsylvania, largely.

The gentleman did not say a word about buckwheat; he left that out, never said a word on that. Why didn't he give Clearfield and Butler and the northern tier of counties a little uplift on the buckwheat question and say that Butler, Crawford and Armstrong were all such great growers of buckwheat? These chaps take it that we are the buckwheat farmers; I am glad to have that thought, but couldn't you be charitable and say to these buckwheat farmers, what you are doing in your report? All these things help along; it gives a little lift; it helps encourage us who are weak. You strong people some of you don't grow such great crops of hair on your head; some of our people up north are better in that line, but we would like to have just a little lift of encouragement as you go along, when you compare these statistics.

MR. HERR: I appreciate the gentleman's remarks and the fact that he has even recognized the report; I did not think he would even do that. One thing I have given you, I have only given you facts. I know a very honorable gentleman from the buckwheat district of the State, who says they only grow it where they can't grow anything else, so you would not expect very much buckwheat; therefore it is hardly worth while to report on it. But that is not the idea of a report. I will admit that a very large portion of the State of Pennsylvania is not devoted to corn. I will admit that; therefore, when they do grow corn, how are you going to make a report? What are you going to report, when you have nothing to report?

MR. HUTCHISON: Report buckwheat.

MR. HERR: I had a letter the other day from a gentleman who had 60 bushels of buckwheat from the buckwheat district, and wrote to a man in Lancaster county to get him a market for it. We don't write to Pike county or any other part of the State to find a market for corn. Why shouldn't the buckwheat man get a market for his product where he grows it?

MR. BECK: He knows you couldn't raise buckwheat in Lancaster county.

MR. HERR: I helped to grow some some years ago, but the report shows the possibility of what can be done. Invariably a very large percentage of a man's success in agriculture is the man behind it himself. I will venture the assertion, you take, I don't care what part of the State, and you will see success in every county along certain lines, and very frequently it is the man behind the job.

MR. BECK: It don't take much of a man to be a farmer in Lancaster county; but it does take a courageous man to be a farmer in some of our up-State counties.

MR. GLOVER: I notice that the average is 18.8 bushels of wheat. We hear that the soil is being depleted. I remember when the average yield was 13 bushels. Has this increase beeen due to better farming or to the fact that we have had more favorable seasons? Another thing, you will notice that last year the prices were materially better than for years previously which goes to show that a smaller production per acre with better prices is always more profitable than a large yield at smaller prices, yet we are continually trying to grow more and get less for it.

PROF. MENGES: I happened to be in a county a week or so ago and we were comparing notes on corn raising and I found a farmer in a county, or a number, who had raised anywhere from 100 to 132 bushels of shelled corn to the acre, which was comparatively dry, too—dry corn right in Indiana county. The Chairman of the Institute of that county is here and I presume that he is a little too modest to speak for himself; that is why I am telling this. I wish he would get up and verify what I say, then you would agree.

MR. SCHULTZ: The spirit that exists here right now speaks well for the success of this meeting; I know there is going to be some life in it.

MR. HUTCHISON: I would like to refer to Brother Fenstermacher's remarks in regard to prices. I never saw a day when there were so many men out buying wheat, and I cannot see how the millers down there can control the price. Off the little railroad where I live, last week they shipped 20,000 bushels of wheat, and this week it will run 30,000 bushels. The men are there buying for European markets all over central Pennsylvania.

MR. FENSTERMACHER: What are they paying?

MR. HUTCHISON: They have paid as high as $1.90; they are paying $1.85, I think. The millers cannot control the price, they will have no wheat to grind, they say, next year, the way it is going out. They are paying 60 cents a bushel for oats, and the oats from Chicago are about 61 cents, they were paying that yesterday at our station. I do not think they can control any wheat market or any market this year. Those people across the pond are eating up our stuff and our farmers are getting the money for it.

MR. HERR: I wish to say, in reference to Mr. Fenstermacher's remarks about controlling the price of wheat—since I have been in the department trying to find a market for different farm products, I have received a number of letters where the price of wheat not over 60 miles from Philadelphia, from that point to the Philadelphia market, was as much as 28 cents a bushel below the Philadelphia price. I have those letters in my possession, as much as 28 cents a bushel below the Philadelphia price, and not over 60 miles from Philadelphia. That has come to my knowledge. The question is what to do. Believe me, I am not big enough to tackle that job,

that is a pretty sensitive job to be up against, but nevertheless the condition exists and I doubt very much whether it should exist. I think Mr. Fenstermacher's remarks are really important.

MR. SCHULTZ: I have no doubt at all that all those reports are true, but it comes right back to the farmer himself. A man who goes out to buy things, buys them as cheap as he can, that is business; some farmers are much better sellers than they are buyers and some farmers are good farmers to raise crops but have not got the knack of disposing of them, and of course if the buyer gets hold of that man, he buys his crop as cheap as he can; that's business.

MR. GEORGE: I do not think we need to verify Prof. Menges' statement; but we raise buckwheat in Indiana county too, Prof. Menges can tell you that. In regard to prices, we had no trouble in selling buckwheat there in the west as high as $2.75 for 100 pounds, and we did not have to hunt a market for it even at that price, so we think we have something that we can raise and get the price for it, and we do not have to send back to town for a market for our buckwheat, and we did sell it as high as $2.75 a 100 pounds.

PROF. MENGES: Why don't you tell under what conditions you raised that corn?

The CHAIRMAN: I am very glad indeed to see the interest manifested this morning and the disposition to take hold of these questions and discuss them and bring out the facts. We spent a little more time on this question than was allotted to the various questions, but I thought it was a starter and a very important question. We will now proceed to the next item, Report of Committee on Roads and Road Laws, by Col. John A. Woodward, of Howard, Pa.

Col. Woodward presented the following report:

REPORT OF COMMITTEE ON ROADS AND ROAD LAWS

By COL. JOHN A. WOODWARD, *Chairman*.

The importance of highways and byways to any community or country can be neither exaggerated nor too often emphasized. "Unless the arteries and veins of communication are so maintained in their efficiency as to be capable of properly performing their functions at all times, the highest degree of prosperity will not be attained." This is a costly and laborious task, and the conditions under which it is to be accomplished are such that no small unit of territory or population is equal to it. The power and resources of at least a State must be requisitioned for it.

This is not a new thought. That great leader of public thought and action, Washington, "writing to Patrick Henry, referred to the slight progress that was being made under the direction of the local jurisdiction and suggested the necessity of developing a central state body which should have as its function the promotion of a movement for better roads and for more effective administration of construction and maintenance."

More than a century was required for this great conception to take root in our conservative Commonwealth, but finally it did so and produced action resulting in the erection of a State Highway Department twelve years ago, which was reconstructed into its present rank six years later. However, if at all, defective may have been the legislation leading up to this result, the Department is not responsible for it, nor can it effect amendment. It is the legally constituted authority over the roads of the Commonwealth, and is charged with the execution of the State road laws. It is established in its place, has worn its way into working order, and is doing its best to deserve the confidence of the public.

Since agriculture is the most important productive interest in the State, depending more absolutely than any other upon efficient roads for its successful prosecution; and since this Board of Agriculture is its oldest, most unselfish, and unhampered representative, your Committee ventures to express the hope that the Board shall stand by the State Highway Department whenever it can consistently do so.

Within this year a notable court decision was made in the Dauphin county court by Judge Kunkle, defining and establishing the difference, so far as maintenance is concerned, between roads which have been declared State Highways and given route numbers by act of assembly and those which have been "taken over by the State Highway Department from the several counties," as directed by that act. The decision is that until the State Highway Department shall have formally taken over any such section, and so notified the proper county or township officers, the burden of maintenance remains upon the county or township authorities, as the case may be. It is important in that it will operate to defend the Department from embarrassment in cases where, through legislative log-rolling, sections of road of not sufficient importance to warrant it have been placed upon the list of highways; and to prevent local authorities from neglecting to keep roads in proper repair while the Department is preparing to take them over.

Another decision, perhaps still more far-reaching that the one just noted, made in the Allegheny courts by Judge Davis, holds that "the Commonwealth of Pennsylvania is not liable in law to pay to private individuals, in tort, damages sustained by reason of personal injuries and loss of personal property, even though such injuries and loss of personal property be occasioned through the negligence of the Commonwealth's agents, officers or employees." That seems to be in accord with law, precedent and common sense; and brings directly to our consideration and anomaly in apparently judicially-made law existing in our Commonwealth, which has been brought to the attention of your Committee by a distinguished attorney of the southwestern section of the State, and which he protests as "illogical

and absurd." It appears that townships, which are the unit of our road districting system, may be held for damages to person and property; but that in school districts and poor districts, covering precisely the same geographical territory, this is not done. The learned attorney holds that by the working of this procedure "thousands and tens of thousands of dollars are every year diverted from road making into the hands of individuals through damages;" and suggests as an effectual remedy a simple act declaring that "counties, townships, school districts and poor districts shall not be held liable for the torts, negligence, misfeasance or malfeasance of their officers." Without attempting any argument upon what seems to the layman a common sense proposition, and disclaiming any dictatorial purpose whatever, your Committee suggests that perhaps the Board's Legislative Committee may deem this subject worthy of its consideration.

Substantial support in the efforts to attain "Good Roads" has been tendered in Pennsylvania and all the other states during the year, by Act of Congress of July 11, 1916, the expressed purpose of which is "To provide that the United States shall aid the States in the construction of rural post roads and for other purposes."

The total amount appropriated is $85,000,000. Of this $10,000,000 is to be spent at the rate of $1,000,000 a year in connection with the national forest roads. The major appropriation of $75,000,000 is to be expended within five years, beginning with $5,000,000 for the year ending June 30, 1917, and ending with $25,000,000 for the year ending June 30, 1921.

Pennsylvania's share in this for 1917 is $230,644. This sum multiplied by 2, 3, 4, and 5, for the succeeding five years, will bring to us from the United States Treasury $3,459,660, which must be met in each year by a contribution from our own State of a sum equal to the federal gift for that year. This ranks Pennsylvania as third largest in the list of apportionments—only New York and Texas receiving larger sums. With the addition of the equal amount which must be appropriated by the State to be used for the same purpose, the sum of $6,919,325, is practically available for expenditure upon the "Rural Post Roads" of this State within the coming five years.

The 54,000 miles of these roads in Pennsylvania are located almost entirely in the second-class townships and constitute approximately 67% of the total of 80,000 miles of mud roads with which they are interlaced. Upon this 67% of the "country mud roads" this vast sum will be spent in permanent improvements, under the most careful supervision of the State and National road authorities. A better outlook than ever before. Since "The State is the lowest unit with which the Federal Government may cooperate and only through a State Highway Department," we are fortunate in that the new law finds us with our highly organized department, equipped with a full complement of experienced executives and engineers, ready for the promptest possible acceptance of its provisions.

The immense cost of constructing "Good Roads" is conceded; the much greater cost of maintaining them is illustrated by a little group of authentic figures from our sister State of New Jersey, noted, among other things, for its advanced position upon roads. Governor Fielder appointed a commission to inquire into this new work and

its cost. They reported last July that in nine years ten millions had been spent in constructing roads and fifteen millions in maintaining them. In our own State the cost of maintenance during 1915 was more than four times that of construction. Of course there are factors entering into both these statements which would modify them, but they may serve as illustrations of the relative cost of upkeep. That this cost is not only greatly enhanced but multiplied by careless use of the road is evident to any thoughtful observer.

When it is remembered that all public roads are built at the cost of the public, that is to say by everybody, and that they are used by that same public, that is to say by everybody, it seems paradoxical to add that the relation existing between road builders and road users is, always has been and always will be that of constant antagonism or warfare. The township supervisor drives out in the morning and intelligently superintends the work of his crew in making an excellent piece of dirt road, and is a road builder. When in the evening he starts home in his buggy he at once becomes a road destroyer. The Highway Commissioner wisely and effectively directs the expenditure of six or eight millions (may the amount be greatly enlarged) a year in building the roads of the State; and when he makes a tour of inspection over them in his car, he at once enlists on the other side of the war and becomes one of his own most energetic opponents.

The legitimate traffic on the road, that for which it is purposely built, is always destructive, and there is necessary cost for the constant repair made imperative by this destruction. The careless use of the road unnecessarily adds to this cost of maintenance more than the careless user, the observer knows. If all users can be made to understand that the road is an implement, a tool, which is as much entitled to careful treatment as are the vehicles, whether they be buggies or drays, motor trucks or limousines, which they drive over it, the cost of maintenance would be cut in two more than once. They would not then drive in the tracks of those who have preceded them, wearing shallow, then deeper, and yet deeper depressions, which shortly develop into "ruts," the bottoms of which are made soft by accumulated water, and thereby more subject to further ruination; or down which the water pours and cuts and washes until the road is hardly worth the name; and every one who is compelled to use it exhausts his repertory of unprintable epithets upon the absent supervisor or Highway Commissioner. If the whole width of the road were used with intelligent and purposeful care, instead of limiting the travel to the two narrow tracks made by the wheels, all this would be avoided. Why confine the wear and tear to two narrow lines of the width of a truck wheel when twelve feet of better roadway is available? A recent writer upon this phase of the great road subject said: "By a careful distribution of the traffic over a good road surface, the road may be made to last several times as long as it will last when all traffic concentrates in a single track."

Thus much space has been given to this matter of road care, because it has received so little attention, and because your Committee is greatly impressed by its importance and believes it should be made a subject of legislation. A law requiring vehicles of all kinds

to keep as far as possible to the right of the road at all times, thus compelling the use of the whole roadway instead of but a small portion, would add many times to the life of the road, and subtract correspondingly from the cost of maintenance. Your Committee distinctly advocates an enactment of this character, or one which would empower the Highway Commissioner to make such a regulation, and suggests the qualification of the section men of the Department as officers for its enforcement.

At this point, Governor Brumbaugh entered the hall and was received with applause.

The CHAIRMAN: I declare a recess of a few minutes for the members of the Board to exchange greetings with the Governor.

(Short recess.)

MR. HUTCHISON: Mr. Chairman, I move that a copy of this most excellent report of Col. Woodward on the road question be furnished the Highway Department of our State. There are so many good things in the report and so many things that would be a benefit to the highways and so many good, common sense views, that I believe it ought to be published, put out among the users of automobiles and other vehicles that travel on the roads, and I so move.

The motion was seconded and adopted without discussion.

The CHAIRMAN: It is so ordered. Now we will be very glad to hear a few words from the Governor. (Applause.)

Governor Brumbaugh addressed the Board as follows:

ADDRESS

By GOVERNOR BRUMBAUGH.

Mr. Chairman and my Friends: I am glad for the meeting of this very important Board of men here in Harrisburg at this time, because we have, if we wisely organize the farm thought of this State, the opportunity of accomplishing a very important service to the whole life of Pennsylvania by devoting our time and thought and our earnest efforts in making the farm life of our people more attractive, and more remunerative in every way. In the message which I sent to the General Assembly at its opening, on the second day of January, I took occasion, as you will probably recall, to point out what seemed to me to be the salient needs along the line of the improvement of our agricultural conditions. And, then, in addition to that, in suggesting to the Legislature a general plan of development of the resources of Pennsylvania, a plan that would cover legislative action and foresight for a generation or more, I pointed out, among other things (you will find it on page 7 of the message) this statement:

"By making liberal provisions for our farmers and farm life to the end that it will be increasingly attractive and remunerative to till our soil, to grow our food, to make life in rural places as wholesomely attractive and educative as a wise people should."

The thought underlying that is, that if we are to do for Pennsylvania what we ought to do and what we really can do, we should now begin such a conservation of our soil and such a support of our farm life as to bring Pennsylvania, in the next generation, to the point where her products will be more than doubled and the income to her farm people more than doubled. Now that is not a dream at all. Those of you who are in any way conversant with Pennsylvania conditions know that that is an easily attainable goal, and one that ought to attract the most serious and careful thought of all the people of Pennsylvania. Of the adult population of this State which, in the aggregate amounts to something like 3,000,000 of people, about 360,000 devote themselves to agriculture and to animal husbandry and the care of our forests. In other words, about 11.6% of the whole population of this State is directly in contact with the farm problem of Pennsylvania; they are the food makers, the food producers. They are the people who bring to the markets of the Commonwealth the sustenance for the army of industrial workers in our great mills and forges and factories and other industrial establishments.

Now, if one could sense that problem in a big and right way, it would soon become manifest, as you think about it, that what we need, first of all, in Pennsylvania, is an increased percentage of our people on the soil and an increased understanding on the part of those who live upon the soil, of their possibilities and of their opportunities. In other words, the steady drift of the population of the State to the cities and to the industrial establishments is gradually lessening the number of people proportionately in this Commonwealth that give themselves to the agricultural problem, and we are increasingly face to face with the fact that we must go outside our borders for the food to nourish our own people, a situation which is by no means comforting and an outlook which is by no means satisfactory to the people of Pennsylvania.

About 54% of the soil of this State lying in the interior mountain districts lends itself only sporadically to agricultural interests in the narrow sense of being soil that produces large crops of cereals and other soil grown food products, and yet that great inland tier of counties with its marvelous scenery and its groups of life in villages and towns and cities, constitutes really the hope of Pennsylvania because that is our undeveloped opportunity in this State. It is, I take it, from there, in that DeKalb soil belt, that we shall, in the future, bring to pass the largest possible good, agriculturally, to the people of Pennsylvania. These splendid and highly developed counties in the eastern part of the State lying on the Piedmont Plateau are today producing very large quantities of food; they are well cultivated; nearly all the soil is under a high state of treatment and there is there an agricultural condition which, in a general way, viewed from the point of our present national standards, is entirely satisfactory; in other words, it is doing its part in bringing about

satisfactory conditions of food supply to our people. But this other section which begins here with the Blue Mountains and stretches practically to the Ohio border, that section is, today, far below its possibilities, and is not bringing to the markets of the Commonwealth anything like the products which it could bring if scientific thought, wise management and increased numbers of people turned themselves seriously to the matter of making that one of the productive centers of the Commonwealth.

Now, we are rather fortunate in that we have our State College in the very heart of that community, in one of its most beautiful valleys, and it is, through its experimentation and its work, pushing out, by scientific methods, inquiries that some day will bring to us the solution of that problem, if we who are to be the beneficiaries of that scientific study, will take advantage of that and actually apply it to the soil and not let it lie dormant merely as scientific reports from scholarly men at the laboratories. Some of you probably were with us on the agriculture tour and you will remember up near Snow Shoe, where an experiment on that type of soil, in its most aggravated form of neglect, is now in operation under the State College. That I point to as a type of the thing we must do if, in the near future, we are to bring to Pennsylvania's agricultural problems anything like a satisfactory and helpful solution.

I should like to speak also of another phase of this problem that was impressed upon my mind, particularly during the past year, in reference to the great waste in our agricultural activities in Pennsylvania. We do not even market today what we grow, even at a time when we are not growing all that we should, and I am credibly informed by men who have scientifically investigated the matter, that we literally lost millions of dollars of foods in this State during the past season because nobody turned seriously to the problem of marketing that food supply to the people of Pennsylvania. In fact, during the holiday season, I myself passed through an old orchard that was tilled by my own grand-father, and that orchard was literally covered with frozen fruit that had not found its way to the market. Now we cannot be a prosperous Commonwealth, gentlemen—and lady—unless we make it a point to bring to the market everything that the soil of this Commonwealth produces as a food supply to our people, and the Department of Agriculture here in the past year has given particular study and attention to the importance of establishing a Bureau of Markets to see to it that when a thing does grow upon the soil of Pennsylvania, that that thing will find its best market under competent direction and with immediate returns to the man who grows the food.

I should like to speak particularly of the apple situation in Pennsylvania, in that connection. As we traveled over the State this Autumn, we saw literally thousands and thousands and thousands of bushels of apples either hanging upon the trees long after they should have been marketed or lying rotting upon the soil under the trees, just the neglect of somebody or the inability of somebody to sense the importance of gathering all that food and putting it where people needed it and where at this time, by reason of the unusually high cost of food, all of those apples as well as every other product

of our soil, would have a ready and a welcome market. A friend of mine who is the Minister of Finance of the Government of Belgium, on a mission to this country at the opening of this present dreadful war in Europe, traveling through Pennsylvania and westward as far as Chicago and back by way of Washington to New York again, said that one thing that impressed him above everything else in America was the waste of our people. He had come from a country where husbandry had become intensified and the treatment of the soil had been reduced to a science, where every square yard of the territory of that little country was made to produce its quantum of food for its great population, its congested population, and here he saw evidences on every hand of great waste in our food products and he could not understand how a country could be prosperous when it was so wasteful.

It happened just a few years ago that, with him and some of his collegues at the International Exposition at Ghent, I had the pleasure of sitting for a whole day in a national council of agriculturists called in Belgium for a specific purpose. What do you suppose the purpose was? It was to discuss with the farmers of Belgium how to improve the crop of artichokes in that country. Can you imagine a conference called here in Pennsylvania to discuss the improvement of the best crop in Pennsylvania? And yet the best industry in Pennsylvania is vastly more important to our people than the artichoke industry is to that country. In other words, they had so refined their agricultural problems that the little items had become the great problems for discussion, and because, after 50 years of competition in the French markets, it had been developed that the Belgium artichoke was second and not first in its rating in the markets, this council was held to lift the Belgium crop to the top of the market. Now, I instance that because it is a type of the thing that we are going to do after awhile in Pennsylvania, we are not going to meet and talk about agriculture, but we are going to meet and talk about wheat and about sheep and about grapes and about red beets and about cabbage; when cabbage is $110 a ton, it is a serious matter, particularly to the Germans in Pennsylvania who like sauerkraut, (Applause) (Laughter.). The purpose of this little statement of the situation is to show you that we have reached the point where we cannot compete with the world markets in the major crops, but because of our nearness to good markets, we should so differentiate our treatment of the soil as to bring about a much larger return to the farmer and a much larger food supply to our people. It is easily within our reach to do it. Now I see my friend George Hutchison sitting here and I am going to speak of a thing that has been in my heart for 25 years. As I travel from Huntingdon to Harrisburg, I cannot see why these neglected hillsides that fringe the banks of the beautiful Juniata River for 150 miles to its source, should not be as fine in their grapes and as rich in their vineyards as the banks of the Rhine itself. Some years ago a man who had given the subject some thought and no doubt was entirely conscientious said to me, "You cannot grow sheep in Pennsylvania; that industry has gone by." I am here to say to you that I still believe that if we were to turn ourselves seriously to the sheep in-

dustry, we would there add a quality of return to our farmers, particularly from the soil in the interior of the State to which I have referred, of which we little dream; and if the menace of the dogs that seems to be the source of our concern in that industry is imminent, surely this Commonwealth, through its legislature, can enact a law that will keep the dogs from the throats of our sheep and that will encourage and not discourage the building of a great industry and the cultivation and the care and culture of sheep in this Commonwealth of Pennsylvania. I have a motto down in my house bearing on that sheep problem indirectly which reads like this: "When it has finally been determined that the thing is impossible, watch some fellow do it." I am looking hopefully to the man in Pennsylvania who will solve that problem and fill our hillsides with great herds of sheep which will be a source of food and of wealth to our people and a very great return in money to our farm life, and I think it is easily within our resources to do that thing today in Pennsylvania.

Now, there is a corollary to this subject that I have been discussing, to which I wish for a minute to refer. If we are to grow large quantities of food on our farms and bring a large return to our people who do that service to the Commonwealth, then we must establish now—and when I saw now I mean now—good, hard surface, substantial roads from our farms to our markets in Pennsylvania. (Applause). And in the long, broad analysis of the outlook of your agricultural meeting in Pennsylvania, I can see no immediately beneficial thing more far reaching, more practical in its bearing upon the good of our whole people, than a fine system of highways everywhere wherein this Commonwealth, and I want to ask you men who are here interested primarily in the farm problem, to see to it that one element of your farm problem is a highway from your farm to a convenient and profitable market in Pennsylvania. That we can surely do and that is an investment to which the Commonwealth can turn and upon which it can enter with the absolute assurance that it will more than recover to itself all that it invests in that direction, provided only and always that the money is wisely and honestly expended in that matter. So I stand here to urge you to base your treatment of your farm problems in part at least, upon the development of an adequate highway system; not necessarily great arteries of roads at high cost, threading eastward, westward, northward and southward in your State, but highways that will bring the farms to the nearest market stations in the Commonwealth. That is the important thing today, for, after all, gentlemen, if we are to increase the population devoted to the cultivation of the soil, we have got to increase the facilities for marketing the things which they grow on the soil, and that spells good roads in the farming communities.

Finally, I want to speak of another phase of your problem. I was born on a farm and possibly most of you were. We know something of the meaning of farm life in rural Pennsylvania as it was and as it is today. If we are to keep our own people there, our boys and our girls, and make them our heirs in the development of our agricultural interests, we must make farm life not only more re-

munerative in dollars and cents, but we must make farm life more attractive socially and intellectually to our people. There ought to be in the great schoolhouses that are beginning to arise in Pennsylvania, consolidated schools, evening entertainments of all sorts to develop the social as well as the intellectual life of our farm people, so that the young people living out in the country will have the feeling that they are getting there what they would get under vastly less fortuitous conditions were they to go into the city. Now, it is a serious matter when a boy goes to a city or when a girl goes to a city; you hear now and then of the accidental one that has became a great man, a captain of finance, a leader of industry or a man of affairs, but we do not hear of the hundreds and hundreds of these people who ought to have remained on the farm but who, when they go into the city, find a civilization and a social organization so complex and at points so menaceful to them that, after years of effort, they are submerged into its body and they are not again considered or thought of. We lose them, lose them as productive units often, in the city, lose them utterly, where their genius and enterprise would have brought the largest good to the whole Commonwealth out upon the farms where they were born and where their fathers and mothers reared them and trained them and made them God fearing and God loving citizens. So I should like to see, if I can, a movement definitely pointing to the increasing of the social and intellectual opportunities of our people all over Pennsylvania, so that when we are born in the country, we will be glad to stay there. This is a vastly better program, my friends, than any talk of a return to the farm after once your people have gone to the city, for you know that, as a rule, those "Return to the farm" programs are interesting but never very effective. (Applause).

I want to congratulate you that you are here today, to encourage you to take up every phase of this problem that offers to you any hope or outlook for our people, and to be assured that, as far as we can. here in our public duties and as private citizens, we shall be most happy to promote in every way we can the things which you vision and find to be of good to the farm life of this great Commonwealth of Pennsylvania. (Applause).

MR. J. M. DERR: I feel as though I cannot let this opportunity pass to make a few remarks and show you how much I appreciate this report and the address by the Governor. I wish to state a few facts. Having been born on the farm and having lived there all my life I like to drift off to the city occasionally and then get back again. I want to tell you this is my twenty-eighth years experience as a school teacher; I know that our Governor is a friend of the school teachers as well as of the farmers. I have been on the farm all my life, have been managing a farm, operating my father's homestead, bought it a few years ago and have been operating it for 23 years. I have been married twice and am raising five children and am trying my best to keep them on the farm. I am on a farm of 103 acres and all the help I can possibly get is my 12 year old boy and a boy 19 years of age. I have raised anywheres from 500 to 3,000 bushels of potatoes a year and we can get them marketed and our apples do not go to waste. We could do a whole lot more if we could get the help to do it. I have

more than my share of the hired help in my neighborhood and it costs me $30 a month for my 19 year old boy this coming year, his board is worth $25 a month and horse $5 a month, and I do not know how it is possible for me to develop agriculture in my home county more than I am doing it. I am practicing the 8-hour law, working 8 hours before dinner and 8 hours after, almost the whole season through; teaching a school of 8 months term and following the plow during the summer.

I think we ought to make life more attractive for the country boy and girl. Last night Prof. Kline gave an illustrated lecture, in our Turbotville school; he delivered a lecture on the Panama Canal, a most interesting subject, and had the high school hall filled with people. I suppose there were 250 school children and their parents and neighbors in there. We admitted them free and asked for a collection to supply books for our library, and they gave us a collection of between $5 and $6 last night. We have a lantern loaned by the State Museum; can have it until the first of March provided we give one lecture a week. We return the slides after the lecture and they send us another printed or typewritten lecture. The lantern is easily operated and we had the finest kind of pictures on the screen last night and a very attentive audience, and for the benefit of any school teachers who may be here, I feel that those blessings should be brought to the country schools as well as the children of Philadelphia. During the meeting of the State Grange I was out to the Commercial Museum on 34th Street below Spruce and I saw there two or three classes of school children coming to hear one of those lectures that afternoon, and I understand they have the privilege of going every week to hear those illustrated lectures explained by an expert in the museum. We cannot have an expert, but the lecture is typewritten and the pictures can be thrown on the canvas and I find there is no more appreciative audience for these lectures than a lot of country boys and girls with their parents.

GOVERNOR BRUMBAUGH: I should like to add that the State Library also has lantern slides. not devoted to commercial subjects so much as those of the Commercial Museum, but more particularly to the history of the development of Pennsylvania, that you can have for the asking, and if you can borrow a moving picture machine, we have films displayed at the Panama Exposition that you can have free illustrative of all these industries, the development of all these industries of Pennsylvania. That is a thing I had in mind to make the social and intellectual life of the rural community so attractive that our young people will want to stay there and help to solve the problem.

MR. HUTCHISON: Knowing the Governor as well as I do and knowing that he has devoted his life to the uplift of the country people, when he was our County Superintendent years ago I heard him speak frequently and the seed he has sown in our county has borne fruit a hundred fold; he is one of the men who like our forefathers chose the hill country. Brother Patton's father went over there; my father came from Ireland; the Governor's people are of German

descent and they settled in that country to hew out a living and I often think what an effort it was to go into that country and clear out that land and what faith they must have had in the future, and we are enjoying the fruits of their labor. There are great possibilities in central Pennsylvania for agriculture. We have misspent a great deal of time and money, but with the means now at hand furnished by the College and the National Government and from all other sources, we are coming into our own, and I hope to see the day that our people will have a great uplift in this line. That is a thought that has been in my mind, and this great amount of wealth that is coming to the farms of Pennsylvania through the increase in the price of products, if they would only place it to the right use.

As I go through the country and see the mother and grandmother that carried the water from the spring away below the house for generations and see how, by a little ingenuity, that water could be placed in the house and then there could be a bath room placed in there and the mother and daughter and sisters were to have the advantages of that home life that is better than a piano, those comforts, and it is better than money put into a bank or put down in Florida or way off where you will never see it again. Why not take some of this great wealth that is coming into our country today, in the farming regions, and have some of the comforts of life for the people? Have your house heated; that is no extravagance; that is a saving; you are firing one furnace to heat the whole house and not a lot of stoves, and have everything comfortable, and then you will solve the question how you can keep the boy and girl there. They go off to visit in the city and see all these comforts and say, "Why do we not have them?" I was just as guilty at one time, but I got new light on that. Are you guilty of not applying this money to the comforts of home? Oh, what a great uplift these little high schools have been. And, as the Governor was speaking, I thought of two boys in our community whose fathers would not keep them in the high school, and of one boy whose father, a member of the Cox family, the Germans, kept his boy in the high school, and those boys went out in the battle of life, and the two whose father would not keep them in the high school are working at humble work, at day labor, while the little Cox boy has a clerkship in Osceola Mills in the freight office, and some day he may be the freight agent or ticket agent. Why? Because his father and mother were educated at the College and got a vision for the Cox boy and kept him at high school—only a little small school, but we are turning them out as teachers, as you encouraged us, Governor, years ago, to do. That is the uplift we can give.We cannot do great things, but we can help some boy or girl in our community roundabout, and if we make good where we live, it is the greatest thing we can do. I dont care what they say about me down in Philadelphia or Pittsburgh so much, but how does George stand at Warriors Mark? That is the question we have got to answer, and among my own people? I thank God they have been good to me.

MR. PIOLLET: One word of the Governor's speech struck me more forcibly than anything else, and that was the marketing problem. Speaking about the apples, we could not afford to pick the apples and sell them at the price offered in our locality and we could

not get the help to do it. We had an abundance of hay. Hay is worth $10 to $12 a ton. Potatoes were worth $2 a bushel, but there were not very many grown. We would like to have all these beautiful things Brother Hutchison tells about on our farms, but the ordinary farmer cannot afford to do it; we cannot get the money to do it; we have all we can do to get money enough to pay our taxes. (Laughter and applause.) And we don't have money left to improve our farms and keep the buildings in condition and the fences up as they should be. We cannot get help enough, in the first place, to till our soil as it should be, and the conditions in our country have been such that the price did not pay for the effort to gather the apples and send them to market.

MR. J. M. DERR: I do not believe in anything of the kind; I have bought the farm and I am going to have some of these comforts while I live. I came to Harrisburg about three years ago to one of these meetings and I spent more time in running around looking after the electric light system than I did in listening to these talks. I went along with Mr. Young, the manager of the International Harvester Company, out to his home on the river and I saw the electric light plant working there, lighting his home, and I ordered a plant and we have light now from the cellar to the garret, in the pig pen and all through the house, and we have installed a hot water heating system in the house so that every room is comfortable and I know that we can have these things.

The CHAIRMAN: This subject is of very great importance, but we have given it more than the time allotted and we will now proceed to the next subject, "Report of the Committee on Fruit and Fruit Culture," by Mr. A. I. Weidner.

MR BELL: I just want to add that they are spending all their money in automobiles up in Bradford county I want to say this in reply to the speaker who last had the floor.

The CHAIRMAN: I must insist that I have announced the next subject.

MR. PIOLLET: Well, they buy Ford's mostly and they only cost a little.

MR. KILLAM: I move that we receive the report of the Committee on Credentials at this time.

The motion was seconded and adopted.

REPORT OF CREDENTIAL COMMITTEE

Your Committee on Credentials has examined the certificates of election of the following persons elected to represent their respective Societies and Associations on this Board, namely:

Washington,	James M. Paxton,	1920
Delaware,	Thos. H. Wittkorn,	1920
Franklin,	John P. Young,	1920
Armstrong,	S. S. Blyholder,	1920
Dauphin,	E. S. Keiper,	1920
Lancaster,	J. Aldus Herr,	1920
Blair,	W. Frank Beck,	1920
Carbon,	M. Edward Lienhard,	1920
Union,	J. Newton Glover,	1920
Montgomery,	John H. Schultz,	1920
Bucks,	B. Frank Wambold,	1920
Warren,	R. J. Weld,	1920
Mercer,	W. C. Black,	1920
York,	G. F. Barnes,	1920
Somerset,	Hon. Robt. W. Lohr,	1920
Wayne,	W. E. Perham,	1920
Tioga,	Calvin H. Dewitt,	1920
Pa. State Poultry Assoc.,	W. Theo. Wittman,	1920
Venango,	Joseph McElhaney,	1918

We recommend that they be duly elected to membership for the respective terms shown on their certificates.

We also recommend that the following persons be granted the privilege of these meetings:

H. A. Surface, J. H. Book, L. L. Kuhn, Noah Hertzler. S. E. Lee. Arthur Roberts, Clark C. Long. John L. Shirk, John F. Brubaker, John F. Gable, S. P. Heilman, M. M. Snyder, D. B. Goodling, E. B. Goodling, C. F. Beck. H. M. Anderson, L. W. Rorkey, L. B. Sellers, Geo. E. Shaw, John A. Beck.

Respectfully submitted,

MATTHEW RODGERS. Chairman.
B. F. KILLAM,
A. I. WEIDNER.
W. F. HOLTZER,
R. P. HEILMAN,
Credential Committee.

The CHAIRMAN: You have heard the Report of the Credential Committee; what is your pleasure.

MR. HUTCHISON: I move that the report of the Committee be accepted, and that the persons named, as representatives of the several counties, be declared elected to membership on the Board; and the delegates named have the privilege of the floor.

The motion being seconded was adopted.

The CHAIRMAN: Any other delegates coming in, can report to the Chairman of the Committee at any time. We will now proceed with the program, and I have the pleasure of presenting Mr. Weidner.

Mr. Weidner then presented the following report:

REPORT OF COMMITTEE ON FRUIT AND FRUIT CULTURE

By A. I. WEIDNER, *Chairman.*

The planting of apples in Pennsylvania seems to have reached its maximum at the present time. There is a feeling among many of the growers that there are enough orchards planted for the present and that there is danger of overproduction. My impression is that it is well to stop planting for awhile, and that growers turn their attention to better care, cultivation, and fertilization of orchards that have been planted.

The San Jose' scale is being held in check the past few years by parasite enemies and by continued spraying with lime-sulfur and the missible oils. There are many other insects and fungus troubles that will keep the orchardist busy to protect the trees and crop to grow first quality fruit without increasing the planting.

The development of the dust spray, of dust spray machinery is promising to be helpful in the care and protection of the orchard and fruit crop. With two men and one team it is possible to cover forty acres in one day and do a thorough job covering all the foliage better than is usually done with liquid spray; and from results obtained the past season is very encouraging. Orchards that require three men and a team two days to spray, can be given the same protection against most insects and fungus diseases in three hours time with the dust method.

Spraying for the codling moth to have best results must be done in from five to seven days after the petals fall. If unfavorable weather should come during that time the large orchardist is not able to finish his work until it is too late, unless he is prepared and has sufficient machinery and help to complete the work in that time, after the petals drop the calyx is open and is turned upward. If the weather conditions are favorable the little apples begin to grow and the calyx commences to close. After that takes place it is not possible to do good work. The poison must be placed inside the calyx and when it is closed it is ready for the codling moth to take its first meal which results fatally. Eighty per cent. of the worms enter the calyx end of the apple.

With proper cultivation, and cover crop, and applying manure or commercial fertilizers as the orchard may need, and the thinning of the fruit, which is essential to the growing of fine, uniform and well colored apples, which will always bring a good price, the orchardist is a busy man. The culls and the faulty apples should be marketed

at the canning house or the evaporator, which always pays a fair price for that kind of fruit, for which they find a ready sale when put on the market in the form of canned or evaporated fruit. If this second grade of fruit is marketed in that way and not put in competition with first-class fruit, good prices will be obtained. We in Pennsylvania need not fear overproduction for some time to come when we realize that we have the best markets of the world at our very door.

The past season has been a good one for the apple growers of Pennsylvania. The crop is estimated at about thirty per cent over the crop of 1915 or approximately 585,000 barrels grown in this State. The price paid the grower was also better than was received in 1915. It is possible that there may some years come, if there is a large crop all over the United States, that there may be a glut in the market and prices be low, but I have observed in the last eighteen years that good fruit will always find a buyer and that it will bring a fair price. It usually occurs that there is a failure somewhere, and that makes it an advantage to sections having a crop to supply the demand.

The peach has not been planted so largely in Pennsylvania of late as the apple, perhaps owing to the trees being shorter lived and more easily injured by cold during winter and spring frosts. It is also necessary to care well for the peach orchard to get best results. The cultivation in the first part of the season must not be neglected in order to get good thrifty trees and fruit buds. It is now believed necessary to continue to cultivate a peach orchard late as the last of July or first of August in order to keep the trees growing to make strong vigorous buds that will resist the cold of the following winter, and produce fruit the next season.

The constant watch for the borers both spring and fall must not be overlooked as they are the worst enemies of the peach trees. Pruning needs strict attention and the trees kept with low and spreading heads so as to be convenient to gather the crop and to thin, which must be done to grow fine and luscious fruit. A tree that overbears cannot produce fine and high grade fruit. If properly thinned a peach tree will bear as many baskets of large and fine specimens as an overloaded tree will bear of small unattractive and ill flavored fruit. It is necessary to spray the peach as often as weather conditions make it necessary to control the fungus, curculio, and rot. The summer of nineteen sixteen was a remarkably good year for the man that produced fine large fruit. I know of some that were sold f. o. b. in Adams county at two dollars per bushel by the carload, while small inferior peaches did not pay to ship.

The cherry is a profitable fruit to grow where soil and other conditions are right. It requires open, porous, well drained land with an elevation for proper air drainage, for best results. The season of nineteen hundred sixteen began favorably. The crop was large and the fruit was fine. Growers began picking and shipping and were getting good returns and were pleased with the outlook of the crop. But when about half were harvested rain began and continued quite awhile, so that picking stopped and the remainder of the crop spoiled. The cherries cracked open and began to rot and were unfit for market. So growers after all in some parts of the State only had about half a crop to market.

Taking it all through I think it has been a favorable year for the fruit grower and is encouraging. We have been able, by the help of parasite enemies, and new development in spray material and machinery, and with knowledge that we are constantly gaining, to control the different enemies. We can congratulate ourselves with the prospect that overproduction is not so close at hand as is feared by some pessimists.

The CHAIRMAN: Gentlemen of the Board, you have heard the report; what action will you take?

It was moved and carried that the report be received and spread on the minutes.

The CHAIRMAN: Gentlemen, will you discuss this report? You have 10 minutes for the discussion of each report. If not, we will proceed to the next subject, the Report of the Botanist, Prof. F. D. Kern, of State College.

Prof. Kern presented the following report:

REPORT OF THE BOTANIST

By FRANK D. KERN.

Botany is a broad subject dealing as it does with all of the phases of plant life. Even though we separate many of the economic phases, which are closely related to certain industries, there remain many problems for the botanist, as one interested in plants from a scientific point of view, to solve.

One of the chief ways in which the botanist can be of service to the people of the State is through the identification of plants. Closely allied to this is the weed problem, for people are most likely to seek the identity of a plant which is a nuisance, or which in their opinion may become a nuisance. Your Botanist is consulted chiefly by correspondence and perhaps most frequently concerning weeds, although inquiries concerning plant diseases, mushroom growing, drug cultivation and allied topics are numerous.

It may be of interest to the members of this Board to know that, approximately, 200 species of plants have been inquired about during the last four years. This is no indication as to the number of letters since the same plant may be the subject of correspondence many times during a season. Many samples of seeds are still received but they are referred to the Secretary of Agriculture who administers the seed law. From an educational point of view, however, no opportunity is lost to urge the importance of pure viable farm seeds.

During the year 1916 the most interesting situation regarding weeds was the complaint of a bristly plant, resembling the Orange Hawkweed or Devil's Paintbrush, but having yellow instead of orange colored flowers. Examination showed that this plant is another

Hawkweed (*Hieracium pratense*) perhaps best called Field Hawkweed, but known in some places as King Devil. Previous to this year this weed has been known chiefly from Eastern Canada to New York. We had one report of it in 1913. During the present season it has been located in five places and is said to be spreading rapidly. The region most affected is embraced in Clearfield, Jefferson, Clarion, and Armstrong counties. It is as undesirable as its relative, and the neighborhoods where it exists should be roused against it. The means of control would be the same as for the Devil's Paintbrush. In fields given up to hoed crops persistent and careful cultivation are effective. In pastures or grass lands an application of dry salt spread thickly enough to cover all the plants (18 lbs. to the square rod may be used without injury to the grass) has proven an effective method. This Hawkweed, like its relative, has come to us from Europe. Another plant rather recently adventive from Europe or Asia which is established in our midst is the Siberian Cranesbill (*Geranium Sibiricum*). It is not known whether this may develop the characteristics of a pest but it is widely scattered on roadsides and in waste places about State College. It is always well to watch carefully the spread of an introduced plant or of one escaped from gardens. We have one serious complaint against the Star of Bethlehem, (*Ornithogalum umbellatum*) a bulbous plant related to the garlics and onions, which has been introduced from Europe for garden cultivation. We beg to remind members of this Board that our resources are always at their disposal if they have doubts about the plants of their region.

The more or less incidental interest of the public in the cultivation of drug plants has been somewhat increased by the conditions caused by the European War. We are in need of investigational work along this line. There are doubtless many areas in the State where profitable work along this line could be done. Anyone interested should acquaint himself with all available information and should begin a small way. Many disappointments arise from the assumption that the plants used in drugs can be grown on a scale comparable with the ordinary field crops. A few of them can be so grown by people who have had experience, but for the most part cultivation of drug plants must be practiced on a comparatively small scale, at least until a good start is made. The people can themselves assist in making some headway in this industry by careful preliminary trials and cooperation.

As to plant diseases, the year has not been marked by any unusual development within the State. Fire blight of orchard trees and late blight of potatoes which were epidemic the previous season were present only in usual abundance. One of the most interesting developments within the year was the renewed interest in the white pine blister rust, not only in the State but in the nation generally, and especially in New England. This disease is of interest to those farmers who may have white pine woodlots and to all farmers who raise currants and gooseberries because in one stage the disease affects these plants. There are three diseases of this sort of tremendous interest to farmers. The black rust of wheat affects the barberry bush, the rust of apples affects also the red cedar, and the white pine blister rust affects currants and gooseberries. Wherever these plants

grow in close proximity in the combinations named they are likely to be diseased. To keep them separated, that is, in the case of the apple and pine rusts, will control the diseases. Pines once affected never recover fully. The disease cannot spread from pine to pine. The disease is of such importance that the American Forestry Association spent a considerable part of a recent session considering it. The National Government will be asked for an appropriation to aid in investigating and controlling the trouble. Every state in the white pine belt should aid by appropriations for inspection and investigation. The farmer, if asked to subjugate his interest to the larger interest of the community by permitting his currants and gooseberries to be destroyed, will begin to realize what control of that type means. There will also be restrictions on the movements of nursery stock which will be felt. We cannot keep from having an interest in the situation. The disease was imported from Europe a few years ago on nursery stock and only recently has assumed alarming proportions.

One other movement has been launched within the State during the year which deserves mention, although it may not have the economic trend of those already mentioned. I refer to the organization of a Penn State Chapter of the Wild Flower Preservation Society of America. We have heard a good deal about the conservation of our natural resources, of animals and birds, but almost nothing about the preservation of plants except the trees of the forests. Civilization naturally encroaches upon our native plants and animals. But in addition to that numerous thoughtless things are being done constantly which spell destruction for many beautiful wild plants. We believe it quite as essential to consciously protect the beautiful native plants as it is to destroy the pests. The thoughtless picking of flowers by keeping them from seeding or the pulling up of runners which are for propagation, makes it difficult for the wild plants in the vicinity of populated districts to hold their own. Arbutus, Ground Pine, Moccasin Flower, Laurel, Azalea, and many others might be mentioned. The formation of a society is merely to chrystallize sentiment in this connection and furnish a means for spreading the gospel of protection for these beautiful objects of nature.

MR. HUTCHISON: You made a remark there about the pine blisters. How is it communicated from one tree to another? You were at that point when I had to go to the telephone.

PROF. KERN: Not from pine to pine, but it goes from currants or gooseberries to the pine and then from the pine back to those, and wherever they grow in close proximity, say within 500 feet of each other or possibly half a mile, the disease can be kept alive. If you keep the currants and gooseberries away from the pine regions, both native and cultivated, then you can keep down the disease.

MR. HUTCHISON: Is the disease in Pennsylvania prevalent to any great extent?

PROF. KERN: Not to any great extent, although it has been introduced into half a dozen regions. It is quite bad in New York and very bad in Massachusetts. In my opinion it cannot be eradicated, but I am hopeful. I believe we can keep on planting white pine, I believe we will solve the problem, but we may lose millions of dollars before we solve it. It will be necessary for us to provide State money for inspection and scouting to locate these places and to try to destroy it, and incidentally along with this scouting service, I think we should do all we can to learn more about the disease. There are still a number of things we do not know, so that I think our attempts at control and investigation should go hand in hand.

A Member: What does it look like?

PROF. KERN: It is called the blister rust. Its most serious method of attack is on the main stem of the small trees, seedling trees in the nurseries, five or six inches high. It breaks out in the form of raised, whitish blisters, and those are no good at all, they are absolutely useless; but it will also attack the branches of the larger tree. There it is not quite so serious, but it is perennial there, that is it lives season after season, and the tree will never recover from it. On the gooseberry, it forms a redish or brownish hairlike projection from the outer surface of the leaf; they call it feltrast, I believe, in Germany. The idea is that it grows these little short hairlike projections that lap over one another and make it look like a brownish piece of felt.

DR. BECK: I notice up in the mountain districts of Blair county, the shellbark hickory nut trees are dying in a grove adjacent to my house, eight or nine have died in the last two or three years. What is it?

PROF. KERN: I cannot say, offhand; that has not been called to my attention.

The CHAIRMAN: And the same is true in Armstrong county.

PROF. KERN: It is doubtless some disease that should be investigated.

A Member: The canker worm is in our county.

PROF. KERN: It might be a disease or an insect trouble.

MR. DERR: I have been planting thousands of white pine seedlings and noticed some white pines that have come up there and grown wild and the top stem has been affected as he describes and I did not know what it was. So I suppose that while it cannot be carried from one pine to another, it is likely they are not in danger because there are no currants near them, but I felt interested in keeping them pure.

PROF. KERN: That is probably a weevil that bores into the stem; you say it is in the top of the stem.

MR. DERR: There is a white pine blister.

PROF. KERN: That is simply the resin that comes out.

MR. DERR: These are located in Cumberland county.

The CHAIRMAN: You have heard the report; if there are no objections, it will be received and filed. If Dr. Frear is ready, we will hear his report next, instead of Mr. Tyson's, who will not be able to be in the room for ten or fifteen minutes.

Dr. Frear presented the following report:

RELATIONS OF LIMING TO PHOSPHATING

By DR. WILLIAM FREAR.

Thirty years ago, the subject "Lime versus Phosphates" appeared on nearly every farmers' institute program. The subject then headed a discussion of the relative merits of the two kinds of materials for the promotion of soil productiveness, and implied a similarity of effect for these different substances. Today, we recognize, amid certain similarities in effect, enormous differences in many particulars; so that, now, we are saying that neither can do the full work of the other, and that both must be judiciously used on most soils if their productiveness is to be maintained or increased. We recommend lime to sweeten sour soils, and to maintain their fitness for the growth of plants and of friendly soil bacteria; and phosphatic fertilizers to supply directly to the plant certain elements it is unable to gain from the soil in a single growing season in amount best suited to its largest development.

While old-time teaching, and good teaching, it was, has made most farmers careful about mixing lime and domestic manure before application to the soil, there is no clear vision of the fact that lime and phosphates, both useful, may act upon one another so as very distinctly to diminish or to increase their respective effects. Their use in relation to one another is, therefore, generally without regard to such mutual influences; and indeed, leaders of agricultural teaching are themselves not wholly free from the responsibility of broadly advocating certain policies either in disregard of these mutual influences, or, at least, without calling attention to them.

There is good reason, therefore, for reviving the old topic, 'Lime versus Phosphates,' at the present time, but as the heading for a new discourse, namely, one that deals with these mutual effects, particularly the effect of lime on the several phosphorus compounds used to enrich the plant's phosphoric acid supply.

Some of the most important truths upon this subject had been discovered years ago, but the investigation of scientific workers, Russian, German and American, during the past ten or fifteen years, have greatly increased our established knowledge upon the matters here in question, and have developed a foundation for practice. Since phosphoric acid is so much more costly than lime, and is used so much less abundantly, the question of chief interest is the effect of lime upon the usefulness of the various phosphates to the common crops of our rotations as grown upon the kinds of soils we have to use.

To get a clear-cut idea of the effects of liming upon the taking-up of phosphoric acid by plant roots, we need, to start with, to know something as to the manner in which this is done. Every fact we have upon the subject goes to show that the food must be dissolved in the soil moisture before the plant root, through the thin-walled region near its tip and through its little hair-like branches can absorb it. When we put a lump of sugar into a glass of water, we notice that the water penetrates at once the pores of the lump, drives out in bubbles the air the pores held, makes the lump more translucent, and presently begins to make it fall to pieces. In a minute or two, glancing through the water near the lump, we see, especially if we set the water in motion, little lines showing that the water near the sugar is more dense than the main body of the liquid. After a long time, all the sugar will have disappeared, and the entire body of liquid will have become sweet, equally sweet in every part, if we wait long enough. The water works in between the minute portions of sugar until they are perfectly distributed. The amount of sugar a given volume of water can dissolve at ordinary temperatures is entirely definite. When that much has been dissolved and uniformly distributed through the water, the latter can dissolve no more, until by some means we remove a part of the sugar previously dissolved. The solution is then said to be saturated.

Of some fertilizer materials, such as nitrate of soda, muriate of potash, sulphate of ammonia and mono-calcic phosphate, water can dissolve enough to form quite dense solutions. Likewise heavy brines are formed from common salt. Such substances are said to be very soluble. Ordinary soil materials, on the other hand, while few if any are entirely insoluble in water, dissolve in but small amounts. Very little of them is required to saturate the water, or fill it with all it will hold. Still, their solubilities differ greatly, one from the other. Water in a limestone region is hard from the carbonate of lime and magnesia it carries in solution, while water from a sand spring is very soft because it holds little dissolved mineral matter.

Water saturated with sugar can, of course, dissolve no more of it, unless part of the dissolved substance has first been removed. That does not, however, prevent its dissolving some other material if that material, or its solution products, do not act upon the sugar, the water will take up about as much of it, as it would dissolve were the sugar absent. What is here said of sugar solutions, is true of other solutions. But if the dissolved materials act upon one another, or if they form like solution products, then, according to circumstances, more or less will be dissolved than if pure water were to act upon these sub-

stances singly. Thus, water saturated with carbon dioxide gas will dissolve much more carbonate of lime than pure gas-free water will take up, because the gas acts upon the dissolved carbonate to form an acid carbonate of lime more soluble than the ordinary carbonate.

We must, in the next place, briefly consider the *rate* of solution, or time it takes for a solution to become saturated. For a set of conditions equal in other respects, saturation is sooner reached, first, if the amount of surface the substance to be dissolved exposes to the solvent action of the water is greater; that is, if the material is finely divided and its surfaces are free from coatings of less soluble materials that interfere; and second, the rate is increased if the liquid be stirred, so as to keep the solution from becoming concentrated at the place where the water is in contact with the solid to be dissolved. The more concentrated the solution of the material to be dissolved, the more slowly it takes up new portions of this substance. Diffusion, or the mixing of the different parts of the mixture goes on very slowly, thus checking the rate of the dissolving process.

If now we can, by some means, take the dissolved substance out of the solution, more can be dissolved. If the removing process is continued, a small body of water capable of holding in solution at a given instant only a very small amount of a given mineral, can, in time, dissolve and deliver for removal a very considerable amount of the mineral. Since diffusion is so slow a process, and decreases rapidly in rate as the different parts of the liquid approach each other in saturation, and also as the path is lengthened over which the dissolved substance must be moved, it follows that, if the seat of the removing process is near the point of solution, the efficiency of the solvent water as a source of supply for the removing process, is distinctly increased.

The rootlets and root hairs of the plant furnish an apparatus capable of removing many of the substances dissolved in soil moisture. The thin membranes that form the outer boundary of these plant organs, readily permit the simple dissolved substances to pass into the plant, and the carbonic acid formed by the breathing processes of the underground plant parts to pass out. Complex substances are not able to pass in either direction. Substances that can go through the membrane, salt, for example, can pass in until the solution inside is as strong as that outside. Moreover, the plant changes many of the dissolved materials that enter through its roots, into other substances. The instant that occurs, more of the material can be taken up by the roots, and more, in turn, can be dissolved from the soil.

The plant serves, therefore, as a more or less perfect means for removing the substances dissolved in the soil moisture, and thus makes possible the transfer from soil solid to plant during a growing season, of considerable amounts of materials that are held in the soil moisture in only minute quantities at a given instant.

Consider next, that the roots tend to grow into all the soil nooks and crannies. Especially is this true for some plants and under some conditions of food and moisture supply. With such distribution for a barley plant, Hollnigel found that the feeding mass of soil was sufficient to form a cylinder of solid material of only 1-80 inch thick around each rootlet and root hair. These organs often embraced the

soil particles most closely. Evidently the films of moisture that forced themselves between rootlet and soil particles form with such root distribution, only very short paths for the dissolved materials to travel between soil and absorbing rootlet. With other plants, the distribution of roots each way from the stem is very scanty. Other things being equal, the former plants have a much better chance for life on a poor soil than have the latter plants.

It was once believed that a dissolved material could readily, though slowly pass through the soil moisture from one part of the soil to another where the supply of that material was lacking. We have had to give up this belief as applied to soils in ordinary moisture conditions. We find little such movement, and then, if at all, only when the soil is very wet, as it is during a heavy rain or while being irrigated. Ordinarily, the masses of water are not continuous, but interrupted. Instead of filling the soil spaces, the water is spread in films over some of the surface of the narrower crevices. The larger spaces are filled with air, through which dissolved materials can not jump. Consequently, the feeding area of each rootlet is very limited, and a local deficiency of a plant food can not be made good by such material lying beyond the reach of the roots. This fact emphasizes the importance of thorough distribution of added fertilizers through the feeding root zone of the crop to be benefitted.

Having this sketch of the plant feeding process in mind, let us consider the special case of phosphoric acid. It is one of the less abundant soil constituents, though present in some amount in practically all soils, and in all the rocks from which rocks are dormed. The soil phosphates are all difficultly soluble in soil moisture, hence very delicate methods are necessary to determine the quantities present in drainage waters. Fortunately plants can grow in a solution in which a supply of two parts of phosporic acid to the million is maintained.

There are three groups of phosphorus compounds in the soil that require consideration: (1) Organic compounds, of the availability of whose phosphoric acid to plants little is definitely known. (2) Calcium phosphate, the material of raw rock phosphates and of ground bone. (3) Iron and aluminum phosphates, which are similar in most important respects. In soils rich in calcium carbonate, much of the phosphoric acid is usually present as the tri-calcic phosphate just alluded to. But in acid soils, the phosphoric acid is usually present in basic phosphates of iron and aluminum. Such soils nearly always respond favorably to proper phosphate dressings.

Freshly formed iron and aluminum phosphates are fairly good sources of phosphoric acid to a great many plants. When either pure water or water rich in carbonic acid acts upon them, it dissolves away some of their phosphoric acid, but leaves behind most of the iron and aluminum from which the phosphoric acid has split off, for these residues are little soluble. As the impoverished iron and aluminum phosphates are repeatedly acted upon by fresh quantities of water, they give off their phosphoric acid less and less freely. Consequently, the iron and aluminum phosphates in an old soil, free from calcium carbonate, are commonly very basic and able to give up their phos-

phoric acid only at a very slow rate indeed. Still, a few crops as the vigorous rooted oat plant, sometimes are able to get from their source enough phosphoric acid to thrive, when wheat would starve.

The behavior of calcium and magnesium phosphates when attacked by soil moisture is quite different. While phosphoric acid is probably split off from the lime and magnesia, both of these bases are soluble in water. Consequently the rate at which a new portion of water can dissolve phosphoric acid from the insoluble residue is probably little, if at all diminished. Water rich in carbonic acid has a much greater solvent action than pure water. So long as the lime and magnesia are removed from the soil moisture as rapidly as the phosphoric acid is taken up, the rate of attack upon the lime and magnesium phosphates is not diminished; but, if for any reason, the soil solution becomes saturated in these basic materials, then the phosphoric acid dissolves more slowly, and many cases altogether to split off from the phosphates of these bases.

We are now ready to consider the bearing of these facts upon farm practice. Consider what happens to phosphatic fertilizers immediately upon their introduction into the soil. Ground bone, ground rock phosphate, precipitated bone and Thomas slag are brought to the land in various degrees of fineness, but all, except precipitated bone, are much coarser than the particles of most solid products thrown out of solution by chemical action. All of these phosphates have but slight solubility. Any transfer of their phosphoric acid to other parts of the soil as the result of chemical reactions carried on through the soil moisture, must go on but slowly. This results, of course, in a relatively long preservation in the soil of the original chemical character of the materials. It means also that any defect by reason of coarseness of particle, and any failure to be mechanically well distributed through the root-feeding area, must very gravely lower the usefulness of these phosphates to growing crops.

On the other hand, acidulated phosphates carry their phosphoric acid in three conditions: One, the 'insoluble,' like the lime, iron or aluminum phosphates in the original rocks or bone; another, in the more readily attacked reverted phosphates of lime, iron and alumina; a third, fairly soluble in water. The first two groups of phosphates are usually very fine, but their distribution must be effected, like that of the raw phosphates, by mechanical means. The third group is capable of distribution by solution in the soil moisture. It is true, that when thus dissolved, the water-soluble phosphates are quickly acted upon by soil materials, magnesia, iron and alumina, and thrown out of solution. But the compounds formed are very fine and they are distributed wherever the reacting materials lie. It is to these two facts that the commonly superior effects of the said phosphates are usually attributed.

It is a very common belief that the acid phosphate left in the soil after the first crop, has lost its usefulness as a fertilizer. This is certainly not always, and probably nor ordinarily true. The phosphoric acid may be taken up more abundantly than needful by the crop to which such dressings are applied. Acid phosphates are usually applied frequently and in small amounts. The after effects

of large dressings are not often determinable, because of these methods of use; but where conditions have made judgment possible, the residual effects have been found quite durable.

The way is now open for a consideration of the effects of liming in light of our theories of solution. Without attempting to present the details of the numerous experiments as to the effects of liming upon the usefulness of acid phosphate dressings, we may say summarily that ill effects are rarely apparent, and good results common.

The good effects may really be due to independent actions of the lime and the acid phosphate; but they are no doubt partly owing to the fact that, when the soil moisture contains much carbonate of lime, the water-soluble phosphates are converted into tri-calcic phosphate rather than into phosphates of iron and alumina, the former continuously soluble at a good rate, the latter at a gradually decreasing rate.

When we turn to the effects of liming, whether by use of lime or of its carbonate-ground limestone, marl, etc.—upon the unacidulated phosphates, raw rock and ground bone, we find a practically universal reduction of the crop effects of these phosphates. This is true even when the two dressings are applied to acid soils. The acid carbonate of lime in the soil moisture depresses the solution rate of the phosphates. The crop result is exactly in accord with our theories.

But, you may say, "Hold on!" Didn't you say earlier that soils rich in lime were noted for fertility, and therefore must yield phosphoric acid well to the crops? And haven't you just said regarding acid phosphates, that liming more frequently increased rather than diminished their crop effects, any yet that the phosphate resulting from their application to a lime rich soil is the same tricalcic phosphate that is found in raw rock and ground bone? How then should liming depress the crop value of this same material supplied merely from a different source?

These questions are precisely logical, and my answer must be that our theories have not yet caught up with the facts. That is, however, no sound reason for disregarding well established facts. Every time the matter has been well tested, when the lime has been used with ground bone or raw phosphate rock, on lands deficient in phosphoric acid, the crops suffered a lack of phosphorus, gave lower yields and contained less phosphorus when analyzed, than when the raw rock or ground bone was used alone. It is true that on our soils, dressed with bone or phosphate rock, crops are often dwarfed because of acidity, and that the dwarf plants are often unusually rich in phosphoric acid. It is also probably true, as Truog has recently suggested, that those crop species which respond best to dressings of raw rock phosphate—clover, alfalfa, the mustard family and buckwheat—take up larger amounts of lime than do most plants. They would therefore take up both the lime and the phosphoric acid, split off from the rock phosphate as it is dissolved by the soil moisture, and thus prevent such accumulations of lime in the soil water as would seriously lower the rate at which these phosphates are described.

The practical hints that follow from the facts I have presented are:

(1) Raw rock phosphates are best applied to sour soil.

(2) Lime dressings should not be made at the time of the raw phosphate dressings. If the soil is too sour to produce a fair crop, some liming is necessary at once, but only the serious excess of acidity should be first overcome, care being taken to avoid making the soil alkaline.

(3) The application of raw rock or ground bone should be made sometime, a year or two, in advance of full liming, if the best paying results from these phosphate dressings are to be secured.

(4) The raw rock dressings should be applied in close time relation to the use of the ground for crops that feed heavily upon both lime and phosphoric acid.

MR. PIOLLET: Do you advocate putting on both lime and acid phosphate for the same crops?

DR. FREAR: Yes, sir.

MR. HUTCHISON: How long a period should there be between the two?

DR. FREAR: I don't think it makes much difference.

MR. PIOLLET: Would you work the lime in first?

DR. FREAR: I want to get my lime where it will work from the top.

A Member: How would it do to mix the two and then apply them?

DR. FREAR: I have done that and gotten most excellent results, but the trouble is that I do not get enough lime on, working it that way, and do not get a uniform mixture of my phosphate and lime.

I want to come to this next point, and here is the queer thing, in view of what I have just said about the acid phosphate and how little it seems to interfere with it as far as field experiments show; when we come to ground bone and raw rock, we have a very different state of affairs; there has not been a careful experiment made which has not shown that when you put lime and a raw rock and ground bone on the soil together, that the rate of phosphoric acid usefulness to the plant is tremendously decreased.

A Member: In undissolved bone?

DR. FREAR: Yes, the raw ground bone or raw ground rock. The theory I have spoken of explains that pretty well. It does not explain why this behavior of limestone soils, rich in phosphate, is as it is or why the acid phosphate is not likewise seriously retarded in its

solubility by the action of the lime, but it is apparent, so perfectly clear from every careful experiment that has been made, that I cannot help wondering why some of my collegues so freely recommend the use of tremendous quantities of ground limestone and at the same time large quantities of raw rock.

MR. PIOLLET: The acid phosphate is simply raw rock and phosphoric acid?

DR. FREAR: Yes, sir.

MR. PIOLLET: You say they work together?

DR. FREAR: Yes.

MR. PIOLLET: What is the reason?

DR. FREAR: I don't know. Lots of times I have had to say I don't know.

MR. PIOLLET: Perhaps the sulphuric acid is the reason?

DR. FREAR: No, I do not think the sulphuric acid is the reason; it is tied up with sulphate of lime; but this is of particular importance to those who want to use raw phosphates. We cannot expect to get the most prompt returns if we put them on soils that are themselves very rich in lime. Alkaline soils do not do well for these raw phosphates, not within the first few years, at least; I don't know what God may do with them in the course of 100 years; I do not know what of these explanations are due to difficulties of distribution which are worked gradually by natural processes.

Now you will not get your very best returns from raw rock or raw bone except on soils that are somewhat acid. Well you say, then you would not recommend putting lime and ground rock on, those two at the same time. I say that depends. If your soil is so that it will not grow a good crop, your phosphate of lime will not supply enough neutralizing material to correct that difficulty and there is no use spending a lot of money on raw rock if you are not going to get a crop. It appears that their methods must be a partial neutralization of the soil, putting on a relatively low bracing of lime and your phosphate, and mixing both very thoroughly in the soil. Now there are some crops that thrive best on raw rock and others that do not do so well on raw rock. Those plants that thrive best seem to be the ones that take up lime most freely. If it happens that their phosphate of lime is dissolved in the soil and the plant takes up both the lime and the phosphoric acid at the same rate or nearly the same rate in which they were present in the original compound, the solid material from which the soil moisture gave its supply. Then the lime accumulates in the soil moisture and the solution will go on at its normal rate. That seems to be true of alfalfa, mustard plants, buckwheat, all of them carrying high amounts of lime.

Finally, the question of distribution is most important for these materials; they do not diffuse readily; they should be fine and especially fine, and then they should be thoroughly worked through the soil by mechanical means if you are going to get your 100 cents worth out of a dollar invested in them.

The CHAIRMAN: The report will be filed and put on record. We will now hear from the Pomologist, Mr. Chester J. Tyson, of Floradale.

Mr. Tyson then presented the following paper:

REPORT OF POMOLOGIST

By CHESTER J. TYSON.

You will recall, in my last report, that I urged you to select, in my stead, an expert Pomologist who could give you the best up-to- date information along the lines of scientific pomology. I meant just what I said, but you have not seen fit to relieve me. From this I am going to assume your approval of the kind of a report I have been making, and again devote this paper to a few phases of business fruit growing that seem to me to be more or less vital.

This is legislative year and many bills will be introduced in one way or another affecting the business of fruit growing. Some of these will be good bills and some of them will become laws. Unfortunately, many bills are introduced without proper consideration of results, or with some selfish motive. Let us make it a part of our business for the next few weeks to keep in touch with legislative matters through our representatives. Too much legislation can ruin any industry. Let us have less of it and let us do what we can to prevent the passage of bad bills.

During the session of 1915, an effort was made to pass an apple package and grade bill. Such a bill was introduced and its passage urged. Members of your body felt that such action was premature and unwise, and the bill was defeated, after passing the Senate and second reading in the House. Some thoughtful persons feel that Pennsylvania is not yet ready for legislation of this kind; some others feel that we already have too many laws; while still others seriously doubt the wisdom of establishing further salaried state inspectors. I am inclined to side with all three of these views, and yet each one of us has at some time or other, had knowledge of dishonest practices in the matter of packing fruit, and has wished that some way might be devised to end them. Moreover, several eastern states, eight I believe, have passed grading laws in the past few years, and still others are considering such laws, so that through the whole eastern United States is a growing sentiment in favor of better packing methods and a demand for carefully thought out and wisely planned legislation affecting packages and brands. Moreever, there

is a growing feeling of dissatisfaction on the part of retail dealers and consumers, who contend that they are not getting a square deal when they buy a barrel of apples on the basis of its "face" or top layer, and then find from twenty-five to fifty per cent. of the balance of the barrel materially smaller and of poorer quality. No doubt you and I would feel the same way. At any rate, many of these people are demanding that they be given some legal guarantee that they will get what the pay for. They have the ear of the newspapers and can make a lot of noise, as shown in the recent egg and poultry boycott agitation. So urgent have these demands become that bills will be introduced in the coming session to regulate the packing of apples. Instead of condeming the whole procedure and preparing to fight it, had we not better calmly consider what features should be introduced into these bills to best serve the interests of our business, without bringing hardship on anyone, at the same time recognizing the fact that by giving the consuming public a square deal we gain their confidence. In the end they will use more fruit and our business will prosper.

New York on one side, and Maryland on the other, have passed laws defining certain standard grades for apples in closed packages, based on percentages of color and freedom from defects, and quiring the judgment of trained horticultural inspectors to determine whether or not a packer has been guilty of breaking the law, consequently subject to heavy penalties. In the writer's opinion, these laws are too complicated and too difficult to enforce to fit the greatly varying conditions and the widely scattered orchards of Pennsylvania. Laws which may work pretty well in strictly commercial apple growing districts may easily prove a serious hardship to the owners of small farm orchards. Perhaps three-fourths of the apples produced in Pennsylvania come from orchards that are not really commercial propositions.

Recognizing the demand and acknowledging the need for some regulating measures, there are a few features that can be woven into a law back of which we can all stand, and which are not likely to be opposed by honest apple growers or dealers. It seems to me that a law embodying the following features would meet these requirements:

First. Establishing a standard barrel and a standard box of the same dimensions as the United States standard barrel and box.

Second. Requiring that such closed package of apples be branded with the correct name of the variety, with the minimum size of the fruit contained, and with the name and address of the packer or the person in whose interest the packing has been done.

Third. Requiring that the "face" or exposed surface shall fairly represent the contents of the package.

In all probability such a bill will be introduced and I hope each one of you will do what he can to encourage its support.

You see I have rather definite ideas in the matter of apple branding, but here is a puzzle to me and I hope you can help to solve it.

From all parts of the State where farm lands and orchards join up closely with forests, and particularly with State reservations, we are hearing reports of serious damage to the crops and especially

to apple trees, by the protected deer. I know of cases of damage to apple trees amounting to five hundred up to several thousand dollars sustained by individual growers, some of whom were promised compensation, which has not been paid, while some others have been ridiculed by State authorities for trying to grow apples near the forest lands, which is rather discouraging when we consider the efforts that our Agricultural College and our Department of Agriculture are making to reclaim waste lands for farming and orchard purposes.

The people who suffer tell us that the deer nuisance is becoming worse each year, and that, in their opinion, an open season for does as well as bucks, is the only solution in sight. I have seen the damage; it is genuine and serious and I sincerely hope something can be done to give relief.

For most part, 1916 has been a satisfactory season for fruit growers. The peach crop was rather light, but prices were high for good fruit. A fairly good apple crop ruled nearly throughout the State. Good prices were paid to growers, and in most cases dealers who bought apples have made money, which leaves a good feeling for next season.

Some new enemies appeared and some old ones were quite serious. Damage from mice seems to have been severe, while many parts of the State had serious fungus attacks. We are again impressed with the fact that in fruit growing, as in many other lines "Eternal vigilance is the price of success;" fortunately too, for otherwise everyone would plant apple orchards.

The CHAIRMAN: Gentleman, you have heard the report. If there are no objetions, it will be entered on the minutes. Have you any discussion of the subject? If there are any members coming in or any representatives of other societies since the Committee reported on Credentials, they can hand their names to Mr. Rodgers at any time and the Committee will make subsequent reports.

The Board took recess until 1.30 P. M.

Tuesday Afternoon, January 23, 1917, 1.30.

Mr. P. S. Fenstermacher in the Chair.

The CHAIRMAN: It is now really twenty minutes after the appointed time for the opening of this session. I don't know what we will do with these laggards and truants that don't show up in time. There is no penalty we can apply to these fellows that don't come in time, that I know of.

The first topic on our program this afternoon is the report of the State Veterinarian. We will now be glad to hear from Dr. Marshall.

DR. MARSHALL: Mr. Chairman and Members of the State Board of Agriculture: I have prepared what I have to say and will read it to you.

Dr. Marshall's report is as follows:

REPORT OF VETERINARIAN

By C. J. MARSHALL, *Harrisburg.*

The State has been free from unusual animal diseases during the past season and has experienced no uncommon losses from those that are prevalent from year to year. Tuberculosis and infectious abortion still continue to be of the most economic importance. To those engaged in animal husbandry both diseases must be carefully considered. Each affects cattle especially and the danger appears to increase with extensive agriculture. Much has been added to our knowledge in the past few years on the subjects of breeding, feeding, the general care of animals, the cause, means of communication and control of their diseases. Much better methods are being practiced along these lines now than were possible in the quite recent past. In the matter of safely controlling tuberculosis and infectious abortion practical results have not kept pace with the scientific progress made in other lines.

There should be some method of furnishing breeders more protection from tuberculosis and infectious abortion than is apparent at the present time. The federal or state government, our colleges, experiment stations and experts are all unable to assure one with any degree of certainty that it can be done. The average breeder may have expected too much in the past from those who should know. All perhaps have depended too much upon the tuberculin test. We have learned some things that can be done, many that cannot, and many points are still left unsolved. Up to twenty-five years ago the State gave very little attention to tuberculosis in animals or man. In 1892 we began using tuberculin to help us find tuberculosis in cattle. In 1895 the work was taken up by the State. Since that time an intelligent, energetic, expensive campaign has been conducted against bovine tuberculosis. Many valuable animals have been destroyed and the work still goes on. What is the result? Have we reduced the percentage of tuberculosis in our herds? Possibly we have. It has not been possible to eliminate the disease from many large herds that were infected and keep them free from tuberculosis for a number of years at a time. There was some reason for hoping that we might be able to identify every tuberculosis animal in a herd with tuberculin and then vaccinate those that were free and make them immune to the disease. If this were possible it would not be difficult to obtain tuberculosis free herds. A plan for immunizing animals against tuberculosis has been thoroughly tried and found impractical. The only plan

we now have for getting rid of the disease in a herd and keeping it free is to destroy all sources of infection. An animal that has the disease is the most important factor. So long as there is at least one animal with the disease in a herd no one can prophecy the extent or spread of the disease in the herd. The rapidity and extent of the spread depends to a certain extent upon the sanitary conditions of the stable and the extent and location of the disease in the affected animal.

One important factor that has mitigated greatly against handling tuberculosis in a sane and reasonable manner in the past is public opinion. In the beginning all cattle that failed to pass the test were destroyed and were a total loss. Not even the hides were saved. It was soon found that the flesh from a high percentage of those condemned could be safely used for food. Public sentiment against using the meat from those that are passed as suitable for food by a federal or state inspector has practically disappeared. It is now known also that the milk from non-physical cases, but reacting cattle, can be safely handled for human food.

We still have no better method for determining the extent of tuberculosis in a herd than the tuberculin test. Nearly every animal that has been tested with it and condemned in Pennsylvania has been killed and examined by one competent to judge whether it had tuberculosis. We estimate that the disease will be found in 98 per cent of the animals condemned by a properly applied and correctly interpreted tuberculin test. It is the writer's opinion that it is not possible to detect it without the assistance of tuberculin or more than 10 per cent of those that positively have the disease. When we began to use tuberculin there was just cause to fear that animals free from the disease would be condemned. It is now pretty generally believed that this is not true and that the test is remarkably reliable on those condemned.

It has been known for a number of years that an occasional chronic advanced case would pass the test but we hoped to be able to detect them by a careful physical examination. We have found recently that an exceptional mild as well as advanced case, and those apparently in any stage of the disease, may not react to the ordinary tuberculin test. Apparently we have been unjust in the past by placing the blame for unusual results too often on the owner or the person applying the test. In many cases recently we have applied a special retest within two weeks after a careful, competent, honest tuberculin test has been made and found many more diseased animals and those that showed it in practically all stages after slaughter. The reason for such results is still a mystery. We now know that the person who depends entirely upon the ordinary tuberculin test to detect all the animals afflicted with tuberculosis in a tuberculous herd is doomed to disappointment. Whether our new plan of using tuberculin will surely locate every animal afflicted with the disease is a question yet to be determined. We do know that it will detect many that have escaped the ordinary test.

It is claimed by some that the tuberculin test is easy and reliable and that everybody should be permitted to use it. Those who have used it most extensively and studied it most carefully are convinced

that it is a delicate test and that it should be used only by those who are especially trained and then only under full and complete state supervision. We have come to a point in the use of tuberculin when we should not try too see how many tuberculin tests we can make but how well we can make them.

The State should set aside a reasonable but not extravagant sum of money for the purpose of continuing the study of tuberculosis. The Department of Agriculture should take charge of a few representative herds, preferably those belonging to State Institutions. The Department should have full charge of tuberculosis and infectious abortion in those herds for several years. If it is possible and we believe it is to eliminate in a practical way either or both diseases then the State would be justified in spending a large sum of money for disseminating this information and putting it to a practical test in cleaning up our herds.

We should continue the tuberculin test and physical examination on dairy and breeding cattle brought into Pennsylvania from outside sources. We might safely dispense with the test on young animals that are brought from certain sections that are known to be practically free from tuberculosis. Whether such animals should be tuberculin tested or not could be left to the judgment of the State Veterinarian.

Each state or the federal government should make the tuberculin test and physical examination free of charge to the owner of pure-bred animals on those that are to be shipped to other states that demand such examinations. The animals that fail to pass the test or examination should be placed in quarantine or destroyed. The owner should not be paid indemnity for such animals unless he is willing to have the tuberculin test and physical examination applied to every animal in his herd and handle it in full accord with state regulations. In either case he should be paid full market value for any animals condemned and destroyed by the State and found free from tuberculosis on slaughter.

All other tuberculin tests should be made under the supervision of the State at the expense of the owner. The State should not be expected to pay a generous indemnity to the average herd owner for animals destroyed on account of tuberculosis until it can be demonstrated beyond a reasonable doubt that the disease can be eliminated and the herd kept clean by practical measures.

The State has not, and should not demand tuberculin tests in any case except on interstate cattle, until it can be shown with a reasonable amount of certainty that the herd can be freed from tuberculosis and kept free. When this can be done an effort should be made to force the examination to the fullest extent and pay a reasonable indemnity for all animals destroyed. While the State does not compel herd owners to have a tuberculin test at the present time there are other influences that practically force them to do so. In some cases local Boards of Health demand the test on animals that produce milk to be sold under their jurisdiction. Many buyers demand a test before purchase and no man wants to keep a tuberculous herd if he can prevent it.

During the past year no indemnity has been paid for animals destroyed on account of tuberculosis, and very little encouragement has been given that the State would ever remunerate the owners for their losses, yet practically as many animals have been tested and slaughtered as in previous years when the State was paying a rather generous indemnity for those destroyed.

Tuberculin tests are usually worthless when applied by one who is not competent to do the work, or by one who is not in thorough sympathy with this manner of exterminating tuberculosis. It is doubtful whether much good is accomplished by tuberculin tests forced on producers by local Boards of Health. It may be useful as a means of eliminating dangerously unsanitary dairies. Where such demands are made either the State or local authorities should bear the expense of the test and see that it is made by none except those who are honest and properly qualified, and then under satisfactory conditions.

It is too much to expect to eliminate tuberculosis with tuberculin alone in herds where sanitary conditions are decidedly faulty, or where it is impossible or impracticable to dispose of those that fail to pass the test or to disinfect the stables and make them reasonably safe for continuing the business.

There is no doubt but that official supervision should be maintained over the health and sanitary conditions of dairy cattle. This authority should apparently be vested in the State.

All worn-out dairy cows that are sold for human consumption should be killed under state or federal supervision, and a more careful examination should be made of the herd to see that no cows are permitted to produce milk for human food when they have diseased udders or become emaciated and are in the last stages of tuberculosis. No animal should be permitted in the milking line that has tuberculosis to such an extent that it shows physical affects of the disease. Many cases of tuberculosis extensively diseased show no physical symptoms.

While it has not been possible to eliminate tuberculosis from herds with any reasonable degree of certainty in the past and while many discouraging, expensive, experiences have been met in using tuberculin, it has been demonstrated beyond a doubt by many sensible, reliable breeders that the disease can be profitably controlled by the judicious use of tuberculin.

It has been observed for a number of years that abortion as well as tuberculosis thrive best and is the most difficult in large herds where new animals are constantly being purchased. It is rather unusual to find such herds free from either disease. In small herds in the rural sections of the State where animals are seldom purchased very few cases of tuberculosis, abortion or sterility are reported.

It appears to be possible to control abortion in breeding herds that are kept in modern sanitary stables where most of the animals are raised on the farm. The task of controlling abortion in herds where animals are being changed constantly and where sanitary conditions around the stables and premises are not first class is a very difficult proposition, and is practically impossible. Animals seldom abort the second time yet they are considered as affected with the

disease and may spread it for a number of years after they have ceased to abort, and in many cases animals that have aborted become sterile or it is not possible to get them with calf. This condition has been brought about often by improper treatment rather than as a result of the disease itself.

No medicine or remedy will prevent or control abortion in a herd. It is possible with proper treatment to cure most cases of sterility if begun in time. It is bad practice to sell animals that abort for this reason alone. A herd from which such an animal goes is already affected and an affected animal will probably carry the infection to the new herd.

It is not impossible to outline a form of treatment for controlling infectious abortion in dairy cattle that will cover all cases. The form of treatment should be left to the good judgment of the person who is trained to give advice on this subject.

A few practical suggestions may be made for those who desire to attempt to control the disease:

Extreme care should be exercised in purchasing animals to prevent gathering those that are infected as this is the most certain way of carrying infection to non- infected herds.

In herds where the disease is known to exist the stable should be disinfected frequently; once a week at least, with some standard antiseptic that has been approved by the Federal government.

If symptoms of abortion appear in an animal, or if abortion occurs before such symptoms are observed, the animal should be removed immediately to an isolated ward and kept there until there is no discharge from the genital organs. The infections material originates from the genital organs of cattle that are affected.

The gutters behind infected cows are especially dangerous; they should be carefully cleaned and disinfected each day. Extreme care should be given to the use of brooms, forks, shovels and shoes of men to prevent carrying infection from an infected animal that has a discharge from the genital organs to the feed, pasture or feeding floor of those that are susceptible.

Special attention should also be given to the prompt removal of the aborted foetus, the afterbirth and manure which has become infected. The foetus and afterbirth should be buried or burned and the infected litter, manure, etc., may be mixed with lime or some other suitable disinfectant and hauled to fields that are not to be used for pasturing cattle.

Nobody at present can furnish reliable information in reference to eliminating or controlling infectious abortion in a way that will be practical and positive for the average breeder. The federal government has made an appropriation of $50,000 for studying this disease. The State should keep in touch with whatever progress is made by the federal government and carry on this work as a demonstration in conjunction with an effort to control tuberculosis.

The CHAIRMAN: Is there any discussion on this report?

A Member: I move, Mr. Chairman, that the report be received and be printed with the minutes.

The CHAIRMAN: Are there any remarks? This is a very important question, tuberculosis.

A Member: Mr. Chairman, I would like to ask the Doctor a question. I think you said in your report that you would advise the Department of Agriculture to test the herds on some of the State farms—would you include the State College?

DR. MARSHALL: I think it would be well to include all the State purchases—clean up those herds first.

The CHAIRMAN: Do you know whether the Department or anyone from your Department had anything to do with testing the herd at State College?

DR. MARSHALL: All tubercular tests made in the State have to be made under the supervision of the Board and then the result reported to the Board.

A Member: Can you account then for the great loss that they've had there recently—to what do you attribute that?

DR. MARSHALL: It is nothing unusual. It seems to be brought out a little more conspicuously in a case of that sort than it does in some other places. We frequently find where every precaution has been taken and you think everything has been done right, suddenly you get a crack that seems to upset every theory you ever had. Probably the trouble in that institution can be accounted to the fact that there was probably some animals from a district that escaped the test and remained in the herd as spreaders, and when there is such an animal in the herd you can't tell how far the disease is going to get, and I don't think there is anything dishonest or anything careless or any incompetent work there at all, but it simply follows as one of the bad results that sometimes happens when you are trying to do every thing just right.

A Member: I didn't have that thought in mind either. I did have this in mind—it seems to me that we ought to find out if there was anything of the kind, or any carelessness, we ought to know about it. I didn't know whether it was because they brought in new animals or because, as you stated, some animals had gotten by the test in some way and affected the whole herd. It is a pretty serious thing to have a thing like that happen, and I think every dairyman is more or less concerned about it, and I have had no chance to talk with anybody and I wondered whether you knew. That is my reason for asking you

The CHAIRMAN: Is there no more discussion on this report?

It was then moved and seconded that the report be received and spread on the minutes.

MR. J. ALDUS HERR: The Special Legislative Committee is ready to report at this time.

The CHAIRMAN: We will hear the report.

(The report was read).

A Member: Mr. Chairman, I move that this report be accepted as a whole and referred to the Legislative Committee.

MR. HUTCHISON: I second the motion.

The CHAIRMAN: You have heard the motion—are there any remarks?

MR. SHOENER: That report is a very lengthy and complicated affair, and very important, involving a good many questions, and I think we should set it aside for discussion before we hand it over to the Legislative Committee. I would, therefore, amend the motion and move that this matter be laid on the table until Thursday morning, when it will be discussed.

A Member: I second the motion.

The CHAIRMAN: I having been a member of that Committee can probably enlighten you—at least, I will try to. It was a burning question at our last annual meeting, you all remember that, and we've gone through this thing, five of us, thoroughly, getting information from all directions, criticism and otherwise, and you must certainly place some confidence in this Committee, Brother Schoener. We've done the very best we could, under the circumstances, and have tried to make a workable, businesslike, practical Department of Agriculture, and take it out of politics if possible, make it more efficient, quit the overlapping, and to the best of our ability we think we produced that kind of a bill, and made it more representative. Now, that's my idea of the Committee—I've given you my version of it.

A Member: It seems to me that that bill is rather lengthy and we are asking rather much at one time, and if we, perhaps, cut it short at some places we would have more chance of having it passed.

DR. BECK: I think a bill as important as that ought to have the fullest consideration. I heard most of it, but I counted 8 or 9 members who were asleep during most of its reading, and I don't think we've had enough time to digest the contents of the paper that has been read. I for one would like to see it held over until we have had a chance to talk it over and read it.

MR. HUTCHISON: Mr. Chairman, my view of that matter is that if this is referred to the Committee on Legislation, the proper time then for discussing it would be when this Legislative Committee makes its report, which would be, according to the program, to-morrow afternoon. I think that would be the proper time to take this up in detail, together with such other matters as the Legislative Committee may have to report at that time. While I'm on my feet, in view of the latitude of this report of this Committee, I would say, as Chairman of the Legislative Committee, that this Committee will meet in the office of the Secretary of Agriculture immediately after the close of this session. I suppose I need not read the names of the Committee—Mr. Rodgers and myself and Mr. Lohr—perhaps, you had better read them, Mr. Secretary; don't forget immediately after the close of this afternoon's session at the office of the Secretary of Agriculture.

DR. CONARD: The names of the Legislative Committee are as follows: Hon. H. G. McGowan, C. H. DeWitt, Hon. Robert W. Lohr, Matthew Rodgers and George G. Hutchison.

MR. HUTCHISON: Mr Chairman, I think that's the proper channel for this matter to go through—that it be now referred to the Legislative Committee, and when the Legislative Committee reports, then you can have a rap at it.

MR. SHOENER: My object in making that motion was because we are requested to stay here for the meeting on Thursday afternoon and as there is no meeting on Thursday forenoon I thought that matter could be brought up then.

MR. HUTCHISON: It will be discussed whenever the Legislative Committee make their report, and that's on Wednesday afternoon. That is a good time, all the members will be here.

A Member: I may be out of order, but I would like to make a suggestion. This matter is a very important one. Can we not have printed copies made of this bill, so we can all read it and be in a position to back it up or make suggestions? I for one am not in favor of all the items in that proposed measure, and I don't think it is very complete either. You must remember there are some legal points that are not covered, and one is, What are we going to do with the Agricultural Commission?

The CHAIRMAN: I am sorry the gentleman wasn't here when the bill was read—you probably just got the tail end of it.

A Member: I believe it would be of advantage to have it published so we can act upon it. I make that motion.

MR. SHOENER: I think it would be a good thing to have a special meeting on Thursday morning to act on this thing.

The CHAIRMAN: I don't want to be arbitrary in the matter, gentlemen, but what have you to say?

MR. STUDHOLME: It seems to me that the regular channel for this is through the regular Legislative Committee. It isn't necessary to have any other special meetings for this subject. There is no effect on the part of the Committee to railroad this thing through at all. It is simply something that we have considered, after careful thought, to be the best thing in the interest of the Department of Agriculture and the State Board, and if there are things that are weak in it or things that we have overlooked, why we are very glad to know it, the same as the rest of you will be, and I am sure there will be every provision made for discussing this report when it is put through the proper channels, whenever the Legislative Committee make their report.

A Member: How are we to know what is in that bill just by one reading of it. I think it ought to be printed or mimeographed or published in some way. It can be done very quickly, and we can all read it over.

MR. STUDHOLME: I would like to ask if the brother was present when the bill was read.

A Member: I heard part of it.

MR. STUDHOLME: I thought so. Well, this meeting commenced at 1:30.

A Member: It's a question whether we are not out of order discussing it in this way. Here the matter comes up and is read—and we started to read at at ten minutes to two—no, it was about two o'clock when we commenced to read that report, and now the report goes to the Legislative Committee, and the Legislative Committee can do as they are a mind to with it. When it comes back it may be so good and it may be so bad—we don't know what the Legislative Committee will do with it—and then it might be advisable to lay it over and let everyone have a copy to go over section by section. It is in their hands now and I understand that is the regular channel.

MR. SHOENER: I will withdraw my motion, and if it seems necessary for the Legislative Committee to make their report we can make another motion to discuss it later.

It was then moved and seconded and carried that the report be received and referred to the Legislative Committee.

The CHAIRMAN: We will now have the Report on Dairy and Dairy Products, by R. J. Weld. Is Mr. Weld's report here?

MR. J. ALDUS HERR: I had a letter from Mr. Weld stating that he couldn't be here owing to sickness in his family, and that he had sent his report to the Secretary.

DR. CONARD: It is not on the table—it is not here. Probably Mr. Patton has it.

MR. J. ALDUS HERR: I presume Mr. Patton likely has it.

MR. SHOENER: I move that if the report is in the hands of the Secretary it be read in public.

It was then duly moved, seconded and carried that the report of Mr. Weld be read when received.

The CHAIRMAN: The next on the program is the Report on Fertilizers. Mr. Brong is not present but he has requested me to read his report. I am not so anxious to do it, but just to keep his good graces I will. Mr. Studholme, will you take the Chair.

Mr. Brong's report is as follows:

REPORT OF COMMITTEE ON FERTILIZERS

By F. S. BRONG, *Chairman.*

Logically any substance or material which makes a soil fruitful or productive is a fertilizer for that soil. But we do not ordinarily speak of many of these things as fertilizers. In this paper we will consider only the principle materials which, by common consent, we have come to regard as fertilizers.

The most ancient, the most common and the most important fertilizer for all soils is the plant which grew out of it, either in part or whole, returned to the soil. With the exception of the excrement of insects and animals and their dead bodies, this plant residue is the only one of the materials which we now recognize as fertilizers that nature used in making the earth fruitful. It is generally conceded that a certain amount of organic matter is necessary for a fertile soil, and our best authorities agree that if this material is present in sufficient amount, then no other fertilizer is necessary. In a half decayed state this plant residue is known as humus. Besides furnishing food for other plants, it improves the physical condition of the soil. The soil particles mixed with the porous, spongy vegetable matter is much more easily penetrated by plant rootlets than the soil in its original state. The dark color so characteristic of a fertile soil is the result of a high humus content. As a ball of cotton will absorb and hold more water than a marble, so a humus filled soil will hold moisture better than one without humus. In Pennsylvania we have an annual rain fall of about forty inches, and if our crops suffer from drought it is our own fault. There are several other very important conditions which decayed, or decaying plants establish in a soil. Among which are more even temperature throughout the year and a congenial home for the growth and multiplication of various classes of bacteria beneficial in plant growth. The natural home of the nodule forming bacteria for the legumes is in a humus filled soil and their artificial culture in laboratories and application to unfriendly soils can result in no lasting good.

When we remember that animal manure is simply the remains of plants or parts of plants that originally grew out of the soil, then we can readily understand why it should be an important fertilizer.

The animal body is composed very largely of the same basic substances that plants are. Animals cannot use these substances for their growth direct from the earth, so they live by eating the plants or other animals that have eaten plants. The part of the plant that is used up by the animal for growth, productiveness or energy, depends very largely on the animal ranging from perhaps five or ten per cent. in fat steers to thirty-five per cent. in growing or producing animals. The remainder is voided as waste to the animals. We have then from ninety to sixty-five per cent. of the original fertility left as manure. Owing to the fine division of the particles, the plant food in manure is more available to growing crops than the same would be in the original plants. Being a natural product manure is perfectly safe under almost any condition. In "First Principles of Soil Fertility," Vivian says: "There is little danger of lasting injury to the soil from the use of manure, while it is possible to use commercial fertilizers in such a way as to make the soil poorer after their use, than it was before."

In the application of manure to the soil, we are thoroughly convinced that it is good policy to use it as a top dressing. When nature wanted to make mineral out of plants she buried them in the earth, but when she wanted to make the soil productive, she kept her plant growth right on top of the ground.

It has been proven beyond question, that in a system of farming where the crops are fed upon the farm, and the manure judiciously saved and applied, and a wise use made of legume crops, the fertility of the soil can not only be maintained, but constantly improved. Instances are not rare where men who have followed this practice are almost forced to sell some raw produce—hay or grain—because they cannot feed it all, and the growth becomes too enormous to plow down. The idea advanced by some writers that the farmer should apply each year mineral plant food—a commercial product—equal to the amount of the plant food contained in the harvested crops, is so prodigiously foolish that it has deceived no one.

There is another fertilizer which we need to consider in this paper. A distinguished foreigner some years ago visited the United States to study at first hand our government and people. After spending some time at his self-appointed task, he returned home and in summing up his impressions said—"The Americans are a commercial people. They are money mad." The fertilizer we would finally consider is "Commercial fertilizer." When science discovered that crops lived and developed by "feeding" on certain elements contained in the soil, it was only a short step to conceiving the idea of supplying these elements in an artificial way. It was soon found that of the ten or more basic materials which plants use, only three of these got any response from the plant if applied to the soil on which it grew. These then are Nitrogen, Phosphorus and Potash.

Experiment Stations have spent more time, more energy and more money in trying to make up a good case for commercial fertilizers than they have ever spent in all the cases which ever came to them directly from the farmer's standpoint.

Commercial fertilizers, as before intimated, are designed to supply some one or more of the three plant food elements, one or more of which is presumed to be the crop limiter in a particular soil. There are certain well known products supplying nitrogen on the market, among them are Dried Blood, Dried Ground Fish and Animal Tankage, Bone Meal, Horn and Hoof Meal, Leather Meal, Garbage Tankage, Nitrate of Soda and Sulphate of Ammonia. Some of these materials also contain a certain amount of phosphorus, and the selling price is usually based on analysis. Both Linseed and Cottonseed Meal were formerly used as fertilizer, but their value as food for animals has taken these products into another class.

Up to this time, the phosphorus has been supplied almost entirely from the phosphate deposits as rock in many of our Southern states. The rock contains from ten to twenty per cent phosphorus combined with lime and is not soluble in water. Manufacturers mix an equal weight of Sulphuric Acid with a ton of this Phosphate Rock, and have two tons of Acid Phosphate, each ton containing just one-half as much phosphorus as the ground rock or floats from which it was made.

As the mines of our country have furnished commercial fertilizer manufacturers with phosphorus, so the mines of Germany have furnished the Potash. Kainit is the crude product of the mine ground into a powder. It contains about 12½% of potash and has a high chlorin content. Muriate of Potash is produced by concentrating, and contains from 48 to 50% actual Potash. In the Sulphate of Potash, the potash is combined with Sulphuric Acid. In all these forms the potash is soluble in water. Under normal conditions, Phosphoric Acid and Potash command about the same price, which is about one-third of the price of nitrogen.

It will be observed that all these substances furnishing plant food, may be divided into two classes: Organic and mineral. As a general proposition the organic materials unchanged are safe to apply to any farming soil. Whether or not it would pay to apply them, that is another story. On the other hand, the mineral substances manufactured are generally unsafe. Our fertilizer laws are framed with the assumption that plants require a pre-digested ration. If a fertilizer furnishes plant food in water soluble form before it is incorporated with the soil, it has the approval, and gets the blue ribbon from the fertilizer control board. We wonder why it has not occurred to scientists to feed these legislators, or whoever is responsible for these laws, on pre-digested milk, eggs and beefsteak; we mean it—pre-digested—actually chewed, salivated, pepsined and boiled.

Has it ever occurred to you that with all our boasted knowledge, all our science, and all our superior wisdom, that we have made no great achievements unless the work in accomplishing those ends has been in harmony with nature? The same Creator who gave a digestive system to animals, also gave a somewhat similar system to plants, and the farming practice which seriously interferes with that system is doomed. When "Bob" Seeds saw how God made a fertile soil and declared that if God could do it he could too, "Bob" was very careful to go at it in God's way.

Commerical fertilizers cost the farmers of Pennsylvania nearly $8,000,000 yearly. Their use has a direct bearing on the future food supply of the State, and it seems to me that the whole subject is big enough to warrant serious legislative action. I would suggest that in addition to the present requirements of the law, that every bag or package of commerical fertilizers, sold or offered for sale in Pennsylvania, should have plainly printed on it the name of each and every material from which the Nitrogen, Phosphoric Acid and Potash contained in the fertilizer has been derived. There should be a sufficient penalty for violators to make it interesting. If you will tell the farmer what he is buying, you may trust his judgment, or at any rate the law will then have done its duty to him. In justice to the small dealer, mixer, or manufacturer, there should be a tonnage tax, based on analysis, perhaps, instead of the present fee system, in connection with fertilizer control work in the State.

The CHAIRMAN: Gentlemen, if there are no objections this report will be received and placed on the minutes.

The CHAIRMAN: If there is no discussion of this report we will proceed with our program. The next report is the Report of the Committee on Wool and Textile Fibers, by Mr. Doris L. Fulkman.

MR. FULKMAN: When the Committee placed me on that subject last year they made a mistake. My predecessor had been a wool grower; but to tell the truth of the matter I have never owned a sheep in my life, so Mr. Black and I have exchanged subjects, and Mr. Black will report on this.

MR. BLACK: If that is agreeable to the Chairman I will proceed.

Mr. Black's report is as follows:

REPORT OF COMMITTEE ON WOOL AND TEXTILE FIBERS

By W. C. BLACK, *Chairman.*

Mr. Chairman and Members of the State Board of Agriculture: In the language of the poet "I am here because I am here." I left my home 325 miles from here last evening and came in a Pullman. I came to Harrisburg from the same home 54 years ago last September. The first portion of the journey at that time by the old stage coach; the second portion on the waters of the "raging canal." When we became tired riding, we got off the boat and walked ahead to the next landing and sat in the shade until the boat came along. At Pittsburg we boarded a train on the Pennsylvania Railroad, riding in a box car with long planks for seats; those seated near enough the door could look out and see the grand old Alleghenies as we passed over and around and through them. Arriving at Harrisburg, I was lo-

cated in the Capitol Park; being hungry I went down street and bought some buns. When night came, "I wrapped the drapery of my couch about me and lay down." The remainder of the quotation does not apply. The drapery was a coarse blanket and the couch was old Mother Earth where the present magnificent capital building now stands.

I was on the program at that time, but the stage of action was further away than Harrisburg. No doubt you will wonder what this has to do with my subject for this meeting. That blanket was the whole thing—Wool and Textile Fibers—and later I learned the use of the gunny sack and the gentle art of weaving Gabions. The making of Gabions has ceased, but will be resumed on the appearance of the first hostile German U coming up the Susquehanna. Many of the textile fibers used extensively in our manufactures are not produced in Pennsylvania.

Cotton: *Gossypium Herbaceum,* is produced in immense quantities in the United States, used largely in our manufactures and exported to foreign countries. Many millions of pounds of cotton were used the past year in the making of explosives. Cotton was at one time produced in Pennsylvania but not for many years. The Sea Island Cotton is produced on islands near our southeast coast. A high grade of cotton is produced in Egypt.

Jute: *Conchorous olitorius,* is a native of tropical countries, a plant somewhat similar to hemp. Vast quantities of jute are produced in India and is used for making gunny cloth, the warp in carpets and as an adulterant in coarse goods.

Manila hemp: *Musa textilis* is produced in the Phillipine Islands and is largely used in cordage.

Sisal: *Agave Americana* or Yucca, is produced in Yucatan and Mexico and is used in cordage. Both Manila-hemp and Sisal are used in the manufacture of binder twine.

Hemp is grown in many parts of the world. Not grown in Pennsylvania but is successfully grown in Tennessee and Kentucky.

Coir, the fiber of the husk of the cocoanut, is used in the manufacture of ropes, being very light in weight but strong.

Flax: *Linum usitatissimum,* is produced in many countries, notably in Belgium and Russia. It is one of the most useful plants, not a food plant, in cultivation. Flax was formerly grown in Pennsylvania. I have seen it grown and pulled and rotted and broke and scutched and heckled and spun and woven into cloth in the neighborhood where I live.

Silk has been produced in Pennsylvania in small quantities but not in recent years. Less than one hundred years ago there was a silk craze in Pennsylvania. Promoters aided by the report of a committee of Congress exploited the propagation of the mulberry tree—*Morus Multicaulis*—for the feeding of the silk worm, claiming that as much as $600 worth of silk could be produced from one tree. Trees were sold as high as $10.00 each, but later could be bought for 3 cents each. There is standing on my farm a Morus Multicaulis tree, a relic of this craze.

None of these fibers are of importance as a product of the farms of Pennsylvania.

Wool is the only fiber of importance produced on the farms of Pennsylvania. Wool is the hair of the sheep and is different from the hair of other animals, having a crimp or wave and is covered with minute over-lapping scales which cause it to retain its shape, when spun into yarn or felted. Different qualities of wool are produced by different breeds or varieties of sheep. The quality of wool is influenced by climate, soil and location.

The different breeds of sheep are classed in three general groups known as long wooled, medium wooled and fine wooled according to the quality of wool produced. Formerly large numbers of fine wooled sheep were kept, notably in Vermont and some parts of Pennsylvania and Ohio and on Western ranches, almost exclusively for the wool and some stud flocks for the sale of breeding stock. At the present time the so-called mutton breeds are in greater demand. What wonder when wool is selling around 50 cents per pound and lambs are worth 14½ cents per pound in the stock yards.

Sheep can be kept on land unsuited for the pasturage of other live stock. Seven sheep can be kept on the pasture necessary for one cow and they will require less forage and grain feed for the winter. Fifty sheep will require no more labor for their care than is necessary for one dairy cow. Sheep feed on weeds and plants, not relished by other farm animals.

Writers on sheep husbandry usually advise pasturing sheep in a field by themselves, and that they should be frequently changed to other pastures. I am willing to go on record as saying that in my experience I have not found this necessary. If you have sufficient range with a good growth of grass, you can turn your cattle, horses, sheep and hogs into the same pasture. Be sure they have an abundance of pure water and salt, ad libitum and there is no necessity for any change of pasture. Many persons say that if you give a sheep all the salt it will eat that it will kill it. A sheep will not eat too much salt if it has access to salt at all times. Many farmers say "a fat ewe will not breed." Ewes do not get too fat to breed. Ewes get fat because they do not breed.

SOME REASONS FOR NOT KEEPING SHEEP.

Dogs—We have always had dogs and always will have them.

Fences—A large part of the tillable land of Pennsylvania is without fences, but sheep can be kept with profit on land not fit for tillage.

Parasites both internal and external—There was a time when some people had them.

I have heard that a buck deer from the State Forest Reservation came into a flock of sheep in Westmoreland county and killed several.

There are many reasons why Pennsylvania farmers should keep sheep. A look over the livestock market reports of recent date is a strong argument. Sheep should be kept to reduce the high cost of living. The farmer's family can eat the flesh, can make clothing of the wool and shoes of the skins of the sheep and with some wheat and corn, apples and potatoes and a little kraut, what need the farmers care for the "high cost of living." He produces all of these things on his farm and "what the farmer raises on his farm does not cost him anything."

The CHAIRMAN: You have heard this splendid report—what is your wish?

It was regularly moved and seconded that the report be accepted.

The CHAIRMAN: The next report is the Report of the Sanitarian, by Dr. S. G. Dixon. Is Mr. Dixon present? If not, we will go to the next subject—the Report of the Miscroscopist and Hygienist, Prof. J. W. Kellogg.

Prof. Kellogg's report is as follows:

REPORT OF MISCROSCOPIST AND HYGIENIST

By PROF. JAMES W. KELLOG.

From time to time during the past few years, your Specialist has been called upon to examine samples of feeds for the presence of poisons which have been suspected of causing illness and death to livestock, especially horses, cows and hogs. During the past year, 15 such samples have been received and examined and in no case was mineral poisons found to be present, nor did there appear to be anything abnormal about the feeds; nevertheless, in every case it was claimed that illness and death had resulted from using feeds represented by the samples submitted which had formed the whole or a part of the ration. In a number of these cases a Veterinarian had reported that the feed used was the cause of the trouble. Because of the importance of and need for locating the causes of these illnesses and deaths among livestock which have occurred, it appears desirable to call the attention of the Board to this subject and to recommend how to proceed in the future in attempting to discover the causes of these complaints and, if possible, to prevent the re-occurrence of such cases of illness and death.

Because of the positive feeling on the part of those submitting samples that the feed they had been using was responsible for illness and death to livestock and because of our inability to find anything wrong with the samples, these cases have appeared mysterious and baffling. Those who have suffered losses and have appealed to us to locate the causes are entitled to assistance and no doubt have felt that we were not doing our duty when we were unable to report that the samples submitted contained poisons. In a number of these cases called to our attention the Livestock Sanitary Board has been requested to make an investigation, but because of delay in getting reports, it was impossible to make post-mortem examinations of the animals which had died and also for lack of complete details, it was impossible to solve the problems. In those cases where death has resulted, the samples received consisted mostly of middlings and corn meal, and in one case tankage. As above stated an examination of these samples failed to show the presence of common poisons and

they did not appear abnormal under the microscope and yet the animals had died and the feeds were said to be the blame. This condition has caused us considerable anxiety for the reason that we want to help locate the causes of illness and death and yet we have apparently been unable to do so. We are, however, not the only ones who have been unable to answer this question satisfactorily, and at the present time the United States Bureau of Animal Industry have been carrying on experiments and making investigations of this subject. The work thus far accomplished by them indicates that there is a powerful poison produced suspected of being caused by certain bacteria which frequently occur under conditions which have been attributed to so called forage poisoning or poisoning from harmful flora or plants which find their way into feeds. It is the duty of the Department to prohibit the sale of feeds which are harmful and we have endeavored to do this as far as possible. We must continue in this work until it can be established whether or not such losses are caused by the feeds being used or due to some other agent.

Primarily, illness and death among livestock is a subject for investigation by a veterinarian, however, there seems to be a tendency to blame the feeds in such cases, especially where it has happened that these feeds were new ones. This tendency to blame the feeds explains why we have been called upon to examine suspected samples. Authorities on the subject advise that the two principal causes of illness and death among livestock are diseased and improper or unfit rations. Disease can, of course, come from improper feeding or outside sources. The list of the diseases and illnesses which can be attributed to improper feeding, as well as by unwholesome food, is a long one and indeed many forms of intestinal trouble can be caused which may end fatally. Serious and fatal stomach and intestinal disturbances are caused by mouldy and damaged feeds, sudden change from a poor to a rich food, green feeds which are damp or wet with dew, excess of concentrated feeds and green feeds causing impaction, feeds which have fermented and contain bacteria causing production of gas, poisonous plants and plants having sharp thorns, foreign material including sand, as well as the common and well known poisons. In most of the cases brought to our attention, the ration consisted of three kinds of foods: the purchased stock food; the home grown product such as roughage and water. Other materials may be also eaten which are not furnished by the feeder and which may be found about the yard, pasture or stables, which can be dangerous. One such case as this occurred last week in which both the Livestock Sanitary Board and Bureau of Chemistry were called upon for assistance. A firm was employed to exterminate rats in a large stable in Pittsburgh. Accordingly the necessary poison was put in a number of places including under the mangers or feeding boxes. The horses seemed more interested in what was on the floor than in the feed boxes and as a result several are dead. We received the sample of feed, as well as the material on the floor, together with specimens of the liver in which to detect the presence of poisons. During June 1915, we received a sample suspected of causing the death to four cows, in which we did find lead present. This being the only case of the positive identification of a poison.

That part of the ration which is usually sent us to be tested for poison is the stock feed. The request to test for poisons which appears so easy to be carried out is in fact difficult and requires considerable time and expense for costly chemicals. There are a great number of poisons, both of mineral and organic character. The mineral poisons are easy to detect, especially the more common ones such as arsenic, lead, mercury and phosphorus and these are the ones we test for. The organic poisons are many in number, difficult to detect and require special equipment and unless one or two are suspected, because of the symptoms noted, such as Strychnine or Cyanide, they are not tested for. Mouldy and damaged grains and feeds can be detected and these are especially dangerous as feed for horses. Only a few such feeds have been found on the markets of the State in the course of our feeding stuffs inspection work, and recently two or three prosecutions were brought and fines paid where such damaged feeds were found being sold. The amount of feed unsold was immediately taken off the market and the manufacturers co-operated with the Department to prevent future conditions of this kind. At the present time a feeding test and also bacteriological tests are being made at the Veterinarian Laboratory of the Livestock Sanitary Board in Philadelphia on some tankage which was claimed to have killed eight hogs. In this case the veterinarian called upon laid the blame to the feed claiming it contained poison. We were unable to find the common mineral poisons present in the sample and a report received on Saturday of the progress being made indicates that the tankage was not the cause of the loss. Again it looks as if we were going to be unable to locate the cause of the trouble. We were unable to receive all the data in this case, yet we made the tests and went to the trouble of carrying out feeding tests hoping to render aid, as all things pointed to the tankage as having caused the trouble.

It is interesting to note here that according to authorities on the subject, the horse, cow and ox, and also the hog, are more liable to disease and disturbances of the digestive organs than are those of other families. In the horse the intestinal surface is double the area of the skin and in the ox, nearly three times the area of the external surface, which necessitates a prolonged retention of the bulky food in the alimentary track for complete digestion. From these facts, therefore, it is not difficult to understand why food that is not normal or is in any way damaged or contains foreign materials, will cause serious and often fatal illness.

In order to prevent, as much as possible, illness among livestock and these losses to which we have called your attention, care should be taken in selecting the proper ration, a balanced ration it might be called, that this food is clean and wholesome, that the feeding places are clean and free from anything which could be harmful, that the water supply be pure, and last, but not least, that the stock receive plenty of fresh air when kept in-doors for any length of time. Care should also be taken in the proper drainage of stables and pens. We are told that disease and illness of one sort or another may occur, which often is wrongly blamed on the feed, from poor ventilation and improper respect for a reasonable amount of cleanliness in the stables, pens or yards.

Now, when illness and death does occur, the Department wants to help find the cause and we ask your cooperation in proceeding as follows: First, call a veterinarian or notify the Livestock Sanitary Board at once and they will arrange to have an inspection made. The ration and water should also be changed in cases of illness. If the veterinarian claims that the ration caused the trouble, send to the Bureau of Chemistry a sample of all the rations used, including any roughage which may have been fed, and we will be glad to make an examination of the samples.

It frequently happens that some one has been suspected of placing poison in a feed or ration. We, of course, cannot protect a man from such enemies nor do we want to get drawn into factional controversies of this kind, as these are personal matters. As above stated, the Department is anxious to solve these problems and with your help and cooperation in furnishing all the information possible, first, by consulting a Veterinarian and then by an analysis of samples ,we hope to be able to be of service and to find the cause of these cases of illness and death among livestock.

It was regularly moved, seconded and carried that the report be accepted and placed on file with the regular minutes.

The CHAIRMAN: Is there any discussion of this report? If there is no discussion we will take up the next subject—Report of the Entomologist, Prof. H. A. Surface.

The report is as follows:

REPORT OF THE ENTOMOLOGIST FOR 1916.

By H. A. SURFACE.

Gentlemen of the State Board of Agriculture: For fifteen years it has been my duty and pleasure to submit to you an annual report, either as Ornithologist or Entomologist. I herewith submit the following as the report of your Entomologist for 1916.

The past year has seen our average annual loss in Pennsylvania of at least $60,000,000 by insects and other vermin, with an increase rather than a decrease. This increase can be expected to continue as long as factors continue that result in the destruction of our insectivorous birds and mammals, reptiles, amphibians, etc. The effects of the efforts of mankind at insect suppression are very insignificant in comparison with those of the various natural agencies that keep these pests in check, although much of its great loss is yet preventable. For example, some persons doubtless lost over fifty percent of their apple crops through pests, while we know others that did not lose five per cent. Ask an experienced truckman what part of his cabbage crop he lost by cabbage worms, and he will say, "Not one percent;" while there are some who would have us believe that over whole areas, cabbage fields were abandoned on account of depredations by cabbage worms.

While there was not as much use made of the spray pump as there should have been, this great loss was not so much due to the lack of spraying as to the failure of mankind to do his part in the great field of natural conservation. While it may not sound right to say that we have over-emphasized spraying in comparison with the attention that has been given to other features of pest suppression, yet it appears true that the *other things* have not been given the share of attention they deserve in consideration of their importance. We must emphasize the necessity of doing these "other things," in addition to spraying, to control insect pests and plant diseases. In fact, this is so very potent that if I were obliged to make a choice between (1) spraying alone (including the three applications) and (2) the other work, I should choose the latter.

Among some of the important items of pest control that do not come under the head of spraying are the following:

1. Cultivation each year or two, to control the insects in the soil, such as White Grubs *(Lachnosterna),* Cut-worms *(Agrotis),* Rose-bugs *(Macrodactylus subspinosus),* ants *(Lasius, et al),* Woolly Aphids *(Schizoneura lanigera),* Plum Curculio *(Conotrachelus neuuphar),* Grasshoppers (*Acrididae).*

2. The removal of eggs of the Tussock Moth *(Notolophus leucostigma),* Canker leaf worm *(Alsophlia pometaria),* and Tent-caterpillars (*Clisiocampa americana),* at the time of pruning, or whenever they can be found.

3. The destruction of fallen fruits and the pests they contain, such as apples with the Apple Maggot (*Trypeta pomonella),* or with larvæ of Cucurlio *(Conotrachelus),* or with the Codling Moth *(Carpocapsa pomonella).*

4. Removal of damaged growing fruits during the process of thinning, thus getting rid of many pests as well as damaged fruits that would make seconds or culls at the expense of better specimens.

5. Removing by hand those pests the spray pump can not reach, such as Round-headed and Flat-headed Apple borers (*Saperda candida* and *Chysobothris femorata),* the Peach borer *(Sannina exitiosa)* and Twig Pruner (*Elapnidion).*

6. Placing poisoned bait, such as the poisoned bran mash, around plants for such pests as cut-worms, earthworms (*Lumbrious terrestris),* etc., or at the base of young trees for climbing cut-worms; or placing a pan of honey-scented sweetened and poisoned water under early and sweet apple trees to kill the fly parent of the Apple Maggot *(Trypeta pomonella).*

7. Pulling out with a brush and promptly destroying the webby nests of such pests as Tent-caterpillars and Web-worms *(Hyphantrid cunea)* as soon as they display their conspicuous flags.

8. Hand-picking such pests as the Red-humped Apple Worm *(Oedemasia concinna)* before they strip the twigs of foliage, and such as the Trumpet-bearer *(a Phycitid),* the ribbed cocoons of the Apple Bucculatrix *(Bucculatrix pomifoliella)* which often are in clusters and can be clipped off, and the flat white cases of the Shield-bearer *(Aspidisca splendorilerella),* the Celery caterpillar *(Papillo asterias),* Potato Beetles *(Doryphora decemlincata)* when few in numbers, the Squash Bug (*Anasa tristis)* when it first appears, cabbage worms on a few plants, etc.

9. Promptly pruning away and burning such pests as the Black Knot of plum and sour cherry, fire blight on apple, pear, and quince.

10. Washing at the right time with lime-sulfur solution to prevent damage by borers, mice and rabbits.

11. Turning pigs into fields infested with White Grubs, and into peach orchards to eat the gum and incidentally the young borers that remain under the gum for over a month before entering beneath the bark; also give the poultry opportunity to find certain insects, especially the Curculio that makes wormy stone fruits. Start turkeys in that young alfalfa field infected with grasshoppers, and see how soon it will be cleaned.

12. Destroy (by burning) all dead trees at once, and thus get rid of the bark beetles (*Scolytus)* and other pests that would develop in them.

13. Destroy wild cherry trees (*Prunus serotina)* and all worthless seedling trees around the premises. This is very important, and a law for this purpose would do much toward holding in check certain kinds of insects which use such trees as reserve multiplying places when kept in control in orchards.

14. Destroying unused portions of plants as soon as the crop is gathered helps to make the spray pump less needed; as in destroying cabbage stalks for aphids and worms, burning wheat stubble for Hession Fly *(Cecidomyia destructor),* and destroying pumpkin, cucumber, cantaloupe and squash vines early in fall in order to kill the Vine Aphis, the Squash Bug and the Squash Borer *(Melittia ceto).*

15. A clean cultivation or ploughing of the apple orchard in midsummer to avert the necessity of the spray pump for a species of Apple Aphis may seem unreasonable, but the connection is in the fact that this particular plant louse passes the summer on the roots of grasses and grass-like plants, and returns to the apple trees to lay it eggs on the apple twigs in the fall. We believe that the first person to work out and prove this interesting point in insect life-histories was the writer of this report, when he was a post-graduate student and investigator with that leader of Economic Entomologists, Prof. S. A. Forbes, of the University of Illinois, in 1893-4.

16. Fumigation of grain with carbon bisulfid for the grain weevil and the Anguomois Grain Moth (*Gelechia cereallella),* fumigating mills with hydocyanic acid gas for the Mediterranean Flour Moth *(Ephestia kuhniella),* fumigating houses with the same gas for household pests, applying mercurial ointment or tincture of larkspur for parasites of body or head, rubbing pigs or other animals with a mixture of lard and kerosene to kill their parasites, dusting fowls with sulfur or Plaster of Paris to which has been added gasoline and crude carbolic acid, to kill their lice, washing roosts with any oil, crude carbolic (dilute) or lime-sulphur solution, feeding house flies poisoned bait or a dilute aqueous solution of formalin, mowing weeds often to destroy stalk-borers, fall plowing to kill cut-worms, harrowing often to kill ants and root lice, etc., all are insecticidal measures that are decidedly effective *without* the use of the spray pump.

17. Planting resistant varieties to avoid insect attacks is a good "stunt" but little heeded as yet, but we know of its efficiency, and especially recommend, for example, planting only apple trees of any kind that are worked on stalk and root to render them proof against Wooly Aphis.

18. Protect our insectivorous lowly creatures, such as toads, frogs, salamanders, lizards, turtles and serpents. Of this long list of groups of animals there are but two species (copperhead and rattler) that are in any way venomous or harmful to man, and all are highly insectivorous.

19. Protect in every way our valuable insectivorous mammals, such as bats, moles, shrews, skunks, and chipmunks.

20. Protect and conserve by practical means (already described) in detail in our bulletins from the Bureau of Zoology of the Department of Agriculture) our many very valuable insectivorous birds, such as the quail, meadow lark, cuckoos, kingbird, fly-catchers, wood peckers, flickers, nuthatches, chickadees, creepers, kinglets, warblers, night hawks, whippoorwills, song sparrows, and others.

21. Destroy but few of the many members of our entire vertebrate fauna, for with the balance of Nature overthrown, who knows where the end must be?

However, we have introduced two bird pests that are not of value as being often insectivorous, and are doing more harm than good. These are the English Sparrow and the English Starling. Nine years ago we reported to this Board the importance of checking the Starling. Soon it will be too late.

The past year was another one during which the Tent-caterpillar was unusually abundant. In fact, there was some talk of observing a "Caterpillar day," but this was chiefly by persons who saw these pests in forests and on neglected trees as they rode along the highways in autos, and did not consider their absence from well-kept premises, how easily they are controlled, nor the many other insects that are more injurious but receiving less attention because less conspicuous.

Canker Worms, especially the Fall Species *(Alsophila pometaria)*, with its peculiar habit in Pennsylvania of ascending the trees in the *Spring* (instead of fall) to lay its eggs, were abundant in a few places, and the outlook promises quite an outbreak of them this year. They are met by banding the trees early (by March 1st), clipping off and burning the egg bands on twigs, and spraying with an arsenate as soon as the larvæ begin to feed.

The 17-year Locust *(Cicada septendecim)* did not develop much in this State last year; but in this year we must expect the appearance of a small and unimportant brood known as Brood XX, of this species, appearing in some of the western and northwestern counties as announced in our Bulletin on this pest in 1907. In localities where they were abundant seventeen years ago, as recorded by the older residents, avoid planting trees this Spring and do not prune young trees liable to much damage until after their eggs are laid. Look out and prepare for the big brood in eastern and southern Pennsylvania in 1919.

The San Jose Scale (*Aspidiotus perniciousus)* was well checked by its parasites, and not many have complained about it, excepting in the western part of the State, where the parasites did not extend, but

it will not stay "down." Under certain conditions, which we foresee possible, we must predict the return of the San Jose scale within a few years, especially if vigilance be relaxed.

Ants and Corn Root-lice *(Aphis maidi-radicis)* were very destructive in some corn fields, but they can be prevented by rotation of crops, Fall plowing and good harrowing to kill all vegetation in Fall and Spring, planting late instead of early, and using nitrogen fertilizer to push growth of corn plants if infested.

White grubs were bad last year, and June bugs (*Lachnosterna fusca* and other species) will appear in numbers this year. It pays to poison the adults by sweetened arsenical spray on the foliage where they feed at night, and let pigs pasture and root where they are in soil this spring.

The Corn Ear-worm or Cotton Boll-worm *Heliothis armigera* was very bad last summer and fall, and must be expected again this year eating green corn, especially sweet corn, beneath the husk. It can be kept out by dusting or spraying with an arsenate as soon as the silk appears, and repeating this in a few days.

The Melon Worm *(Margaronia nitidalis)* was very destructive to melons, squash, pumpkins, and cucumbers, especially in the southern part of the State, and will re-appear this year. Prevent them by arsenical spray on fruits of these vines before attacked, and destroy those infested.

The Grain Weevil and Angoumois Grain Moth continued destructive in stored grain where not properly treated, but many persons followed our advice in fumigating with carbon bisulfid and had good results. Early threshing of grain, not letting it remain long in the straw, is the best preventive of loss.

Apple Aphids and other Aphids were unusually destructive. Tobacco decoction spraying, when strong enough, kills them. The best remedy for the Apple Aphis is to apply strong lime-sulphur spray, as for Scale, just after the leaf buds burst, but before the leaves expand.

Wooly Aphids on the roots of trees are serious in results, but are controlled by removing the earth from above infested roots to expose them, and covering with tobacco dust, and then replacing the earth. Tobacco dust is now prepared and sold commercially for insecticidal purposes.

The root maggots (larvæ of flies of the genus *Phorbia)* have been very destructive to cabbage, radishes, turnips and other Cruciferous plants, as well as to onions, etc. The best preventive is early and repeated spraying with sweetened arsenical solution, such as arsenate of lead.

The Apple Maggot or Railroad Worm extended its range clear across Pennsylvania, from north to south, in accordance with our previous predictions, as it was found destructive in Bedford and some other southern counties, having long been known as very destructive northward. Prevent damage from this pest to early and sweet apples by poisoning, as already suggested in this report.

Dust "spraying" or dusting is again coming around. About twelve years ago the writer and Mr. Gabriel Hiester (then President of the State Horticultural Association) and others had some real experience with it and published concerning it in our reports to this Board. Reports of the State Horticultural Association, our bulletins, etc.

The substance of these reports is to the effect that dusting is not, for most pests, as effective or economic as liquid spraying. Let anyone who may wish try it carefully for himself. It is not a new fad, but has been tried before.

During the past year there was ample proof, in this State, Virginia, and others, of the fact that a slight amount of arsenate of lead added to lime-sulfur solution to apply as a wash for the prevention of damage by borers, mice and rabbits is not injurious to trees. It will be remembered this point was raised two or three years ago, and has has been required to work it out to a final conclusion. One thing is certain, and that is that we were right in saying that peach trees are especially easily damaged by low temperatures if the soil is removed from around them in the fall and not carefully replaced. The damage was due to freezing and not to arsenate.

Finally, let us all take an active part in the modern movement for conservation, and do all we can to secure for ourselves and our descendents the benefits of what should be the results of our intelligent timely actions.

The CHAIRMAN: By Prof. Surface's report, I guess we are going to have another busy year in controlling insect pests. What is your wish in regards to this paper?

It was then regularly moved seconded and carried that the report be accepted and placed on file with the regular minutes.

The CHAIRMAN: The next is the Report of the Ornithologist, Dr. Joseph Kalbfus.

DR. KALBFUS: Mr. Chairman, Ladies and Gentlemen: I hardly think that anything is necessary from me. Prof. Surface has covered the ground so thoroughly that I believe my paper is not necessary except to call your attention to the necessity for work. It's easy enough to prescribe, it's easy enough to tell people how to do things, but if they don't do it, it doesn't amount to very much. While some of you perhaps, may think my paper is sarcastic, I mean every word I say, and I only hope, I only wish that I might be able to say something strong enough to have the farmers understand that it's their neglect in these things that causes the most trouble.

Now, I prepared a paper here, supplemental it will be apparently to what Prof. Surface has read, on the "Value of Birds to Agriculture."

Dr. Kalbfus' report is as follows:

REPORT OF ORNITHOLOGIST.

By DR. JOSEPH KALBFUS.

VALUE OF BIRDS TO AGRICULTURE.

If human beings were able to foresee the result of the many mistakes they are making, or were likely to make, along life's journey, or were even so constructed that the same mistake would not be

repeated, time and time again, many a rough place would be smoothed, to our great advantage. But, unfortunately for us, we appear to delight in ignorance and frequently fail to profit by either our own, or by the experience of those around us. Indeed, some of us seem to really believe there is virtue in the hackneyed expression that, "What one does not know will not hurt us," and are content to remain sheathed in our armor of ignorance. And while I might well say, this applies to men of every walk of life, I cannot help but feel that it prevails especially among that class known as farmers more than in any other class, many of whom are content to follow the ideas of their fathers regardless of consequences or results to them. They perhaps read the agricultural papers, and perhaps the bulletins sent out by the National or State authority, and that ends the matter insofar as they are concerned. The statement from Washington that agriculture lost last year, through ravages of insects, more than one billion dollars, I am confident failed to impress but a limited number of farmers in any way, except perhaps to cause a few to regret that they were farmers. The thought that the reader of the article might do something to correct existing conditions and improve possibilities for the future, in but few instances was given consideration, and in far less instances spurred any one into action. The majority are content to let things go as in the past, and so they move on into the future.

This gate or that gate has had but one hinge for weeks; this board on the barn or on the fence has been hanging by one nail for a long time. Let them hang! The thought that by fixing the hinge or driving a nail or two will improve conditions, to their benefit, apparently is passed without thought. They are content to walk in the footsteps of their fathers. They either do not understand, or they do not care, or both, and the days and the years roll away. To be sure they have eyes to see, but apparently see not. The potatoes are cleaned of bugs up to the time when the owner feels that further effort in that direction will not benefit the growing crop of that year, then he stops, never thinking of next year's crop. The nest of caterpillars is left undisturbed in the wild cherry tree, because it is a tree if no special value. The thought that perhaps these destroyers may migrate to beneficial trees, or may increase next year and become a pest everywhere, is given no consideration. The fact that the topmost shoot on the young pine tree here and there along the road or in the woods, is dead, has excited no special interest and caused no investigation. No one has exerted himself to know or understand why this is so. The majority are satisfied to rest content while the pine weevil increases, to the great injury of everybody, and so it appears to be all around us. Many even become angry because some one understanding the matter, some neighbor perhaps, chides them regarding their negligence. The old tree filled with holes drilled by members of the woodpecker family, and in which the chickadee and nuthatch and thoer winter birds find homes during the cold weather; in which the blue bird and other early spring migrants find shelter from killing storms, have been cut away and gone up the chimney in smoke. No bird house has been supplied to take the place of the old tree, and so the winter

birds go elsewhere, and the early blue bird is compelled to sit out in the cold to freeze and die, while the farmer wonders why it is that his place is so over-run with destructive insects.

Many farmers fail to understand that each order of birds and frequently each species, is doing a special line of work peculiar to that order of species, that but few if any other birds engage in doing to any great extent; some on the ground, some on the trunks of trees, some in the branches, some in the air, some on the water, each one in its place doing a work that in the great majority of cases is beneficial to men, and that is done by but few other birds. This work is done in the majority of cases in broad daylight and right under our eye; still, many men fail to understand the special work of the birds around them. How many know that the Scarlet Tanger feeds almost exclusively in oaks and hickories on insects, of which there are more than three hundred species found in those trees? Or that the Cuckoo and Oriole feed largely on hairy caterpillars, that but few other birds will touch them at all? How many understand that the special work of the Hairy and Downy Woodpeckers is the destruction of the flat-headed and round headed borer found in various trees, especially apple trees, and the codling moth, the insect that lays its eggs in the blossom end of the apple, that later on when hatched and in the larvae stage eats its way into the apple, to the great loss of the fruit grower, How many understand that the special work of the Wax-Wing, commonly called the Cherry Bird, is destroying the canker worm or measuring worm, the little caterpillar that frequently hangs in the air at the end of a long thread of web, and that eats the body out of the leaves of various trees? How many know that the special work of the robin in the springtime is the destruction of beetles and the larvae of beetles, which insects, especially the white grub, destroy the roots of strawberries and grasses, and renders the effort to raise either grasses or berries unprofitable. And so I might go on almost endlessly illustrating what each order, each family and each species of birds is doing for you, each one in its place doing a work that makes the crop of the farmer possible.

How many farmers know that the quail and the turkey and the Rose-breasted Grosbeck are the three birds of America that to any great extent feed on potato bugs? How many farmers know that potato bugs breathe through pores in the skin, and not through lungs, and that if those pores, called spirals in insects, are clogged through the use of slaked lime, or powdered Plaster of Paris, or flour or any other kind of dust, even road dust, the insect will die just as surely as it can be killed through the use of Paris green? How many farmers understand that when they put poison of any kind on potatoes, they are certainly placing sure death in the pathway of their best friends? How many farmers that you know feed the birds around the farm when they need help the most? How many do you know who will take a sack of grain on their backs when the ground is covered with ice and snow in all directions, and hunt for and feed the quail or other birds? Permitting quail to feed with one's chickens when they come that way, is not feeding the birds; work is what counts.

You remember the story of the merchant travelling from Jerusalem to Jericho, who was assaulted by thieves and left wounded by the wayside. You recall how the Priest, from whom, because of his profession, most was expected, passed on the other side. You recall how the Levite, another leader of public thought, did the same thing, and how, later on, a Samaritan, just a common man, one from whom nothing apparently was expected, came that way. You remember what he did, and the Master said, "Who was neighbor to that man?" Who is neighbor to the birds—not the one who professes to feel the most kindly towards them, but instead, the man who does something? A measure of grain placed where starving quail or any other birds can get it; a piece of suet or fresh pork nailed to a tree in the orchard, where the winter birds, such as the Hairy and Downy Woodpecker, and the Nuthatch, the Chickadee, the Kinglet, and other birds can get it, means more to them than does all the kind words or all the prayers that may be uttered by all the people of the country wherein the birds may be starving.

When the farmer, with his wife, his sons and his daughters, learns to understand the birds better, and to do what they can and should do for them, then indeed will benefit come to the land, that can come in no other way, and it can be truly said, "The Winter is over and gone and the voice of the turtle is heard in the land."

I beg the farmer and the farmer's family to study the habits and needs of our birds, his very best friends.

The CHAIRMAN: Gentlemen, you have heard this report; what is your wish in regard to it?

It was then regularly moved, seconded and carried that this report be accepted and placed on file with the minutes.

The CHAIRMAN: Is there any discussion of this report?

MR. J. ALDUS HERR: Mr. Chairman, I would like to ask a little information; is there any data sent out that folks could get relative to how to protect them, that is how to build bird houses and things of that kind?

DR. KALBFUS: We have Bulletin No. 2 that the Game Commission is issuing and would be glad to send it to anybody.

MR. J. ALDUS HERR: Could you get them in any number, that is for distributing in schools?

DR. KALBFUS: Yes, sir. We are distributing them everywhere—in schools, churches and among Boy Scouts and everywhere.

MR. J. ALDUS HERR: About a year ago I had a man make me 14 bird boxes—very crude—and last year there were 12 of them occupied.

A Member: What kind of birds?

MR. J. ALDUS HERR: Wrens, some blue birds and, of course, we had a little fight with the sparrow. Unfortunately, the hole was made too large—that reminds me of the story of the man who built a barn and he told the carpenter to make a hole in the door so that the big cat could get in to catch rats, and then he said, "Now, don't forget to make another hole for the little cat to get in too." But we did have 12 nests in 14 boxes.

DR. KALBFUS: Well, I will tell you of an experience that I had. I built in Harrisburg six boxes for wrens and carried them with me to Bradford county and put them together. Inside of three minutes from the time they were up, there was a wren inside one of the houses, and inside of four days they were all occupied by wrens—and they mean a lot to the farmer.

The CHAIRMAN: If there is no more discussion, we will proceed with the program. The next is the Report of the Meteorologist, Prof. W. G. Owens.

PROF. OWENS: Mr. Chairman, Ladies and Gentlemen: The farmer don't have much to do with the weather, but there is one part of meteorology which, perhaps, he could use to his benefit, so I will speak this afternoon upon the wind.

Prof. Owens' report is as follows:

REPORT OF THE METEOROLOGIST.

By PROF. WILLIAM G. OWENS.

We are living at the bottom of an ocean of air which is believed to be from one to two hundred miles high. But in the upper heights the pressure is so much less than at the surface of the earth that the particles of which the air is composed would not act as they do at the surface.

The air is composed of about 76 per cent. of nitrogen, 23 per cent. of oxygen, and 1 per cent. of inert gases of the argon family, 0.04 per cent. of carbonic acid gas and smaller amounts of ammonia and other gases. In addition there are always present particles of dust, fine organic matter and germs of various kinds.

The chemical composition of the atmosphere is almost constant altho slight variations have been determined by Professor Morley. The variations in carbon dioxide and ammonia depend largely upon the surroundings under which the samples are taken. In districts where fires are numerous they are more abundant than in country districts or especially over the ocean. As plants use these chemicals in their growth their abundance makes quite a difference to the farmer. Farms over which the smoke from a manufacturing district is constantly blowing should be more productive than those which receive only pure air.

The dust particles, organic matter and germs which are found in the air also have an influence on the growth of plants. Anyone traveling a dusty road behind a high speed automobile cannot help but realize that there is a large amount of soil being carried up in the air but perhaps he does not realize that winds are also constantly transforming soil from one point to another, not in such large quantities at one time perhaps but almost constantly. Deserts are covered with sand because the wind has carried away the lighter particles of the soil and in many parts of the country the sand is moved, piled up in sand dunes which often encroach upon the cultivated lands covering up fields and orchards. This often occurs in the great northwest.

Rocks are often formed by drifting soil. The loess formation are of this origin. They are abundant in South America and in China these rocks have reached a thickness of 1.000 feet. This soil is all supposed to have been carried by the wind. Thousands of acres of China were once fertile which are now barren wastes because the forests were all removed and plants which would hold the moisture and the soil were not introduced and so at the present time hundreds of thousands, if not millions of tons of soil, the finest and best, from the surface of the land is usually being blown out to sea, with the result that the country is becoming more barren, if that is possible, from year to year.

The people in Pennsylvania who. perhaps, can best realize what the wind can do are the troopers who are now returning from the Texas frontier. They have been in sand storms where the face of the country seems to be changed by a single storm. The wind carved rocks as in "The Garden of the Gods" in Colorado and the balanced rocks found in many parts of the earth show what the wind can do.

If, therefore, the wind is such an important factor on the surface of the earth, how can the farmer use it to help him with his job? The power of the wind might be made to serve him as it does in Holland and other parts of the world, by the aid of windmills. This no doubt will be the case when the coal supply is further exhausted and the oil gives out. When the storage battery is further perfected it will be possible to light and heat the farm buildings besides doing much of the work on the farm by the power of the wind. That time may be very distant or it may come very soon. Many had hoped that the Edison storage battery would solve the question, but up to the present time the price seems to be prohibitive. Till that time comes about all that the farmer can expect of the wind is to help him pump water to supply the house and barn.

But the wind may also affect his crops. A three mile an hour breeze moves 15,840 cubic feet of air over each square foot of surface for each foot of height above the ground. Tho the air carries but a small amount of ammonium salts with such a large volume air passing one point, if the conditions are such that these salts can be appropriated by the growing plant, there must be some benefit derived. Keeping the ground covered tends to retain this fertility which is constantly passing over the fields.

Perhaps a greater reason for keeping the ground covered is to prevent particles of matter from being blown from the fields and to catch particles which are blown over the fields. Every observer

has noticed how, during windy weather in the winter, when the ground is frozen dry, the ground is blown from around the roots of the wheat stocks, sometimes on exposed spots even killing the plant. What is true of soil movement in the wheat field is true all over the farm where the ground is uncovered. A second crop sown in the corn field will cover the ground during winter and prevent the loss of much fertility. But not only is the soil blown off and so lost to cultivation, as was said before, the air is constantly carrying some of the best fertilizing material in a very fine state of sub-division. If the motion of the air can be reduced so that it is almost quiet much of this will be deposited and so aid the fertility of the field.

Careful measurements have been made and amounts of dust and other substances found in the atmosphere. In England and Scotland during the winter of 1914-15 the amounts collected at 16 stations ranged from 532 tons per square mile, at Oldham, to 332 at Malvern in six months. That collected at Oldham analyzed 1.5 per cent. tar, 19 carbonaceous matter and 69 of ash. Near Pittsburgh the dust fall is reported to be 1,031 tons per square mile per annum. This should give something over 1.6 tons per acre.

As much of this material has fertilizing value, would it not pay the farmer to try to retain some of it on his fields? In the West windbreakers are often used. Would it not pay the farmer in the East to try to conserve the fertility that the air is carrying over his farm in both gaseous and solid forms by reducing the velocity of the wind? Local conditions would determine the methods to be used but when an up-to-date farmer knows what goal he wishes to reach he can generally find the means of attaining it.

The CHAIRMAN: You have heard this report—what is your wish in regard to it?

It was then regularly moved and seconded and carried that the report be accepted and placed on file with the minutes.

The CHAIRMAN: Now that concludes our program for this afternoon. I want to call your attention to the joint meeting this evening in the Board of Trade Auditorium at 7:30 o'clock, and to-morrow morning we will meet at 9 o'clock sharp. I would like to urge all the members to be present at that time. We have a lot of business to-morrow and we don't want to slight any of it. Mr. Secretary, have you any more business for this afternoon?

SECRETARY PATTON: No, there is nothing further. I only want to state that Dr. Dixon has been sick—he has a sore throat—and couldn't read his paper. He sent it in and I will send it to the Secretary. Dr. Dixon has been sick for the last week or ten days.

The CHAIRMAN: Did you receive Mr. Weld's paper?

SECRETARY PATTON: No, I did not, but I have a letter from Mr. Weld, saying that it was impossible for him to be here and giving the reason; but he didn't say anything about his paper.

I don't know if anyone has said anything to the members about going to the Corn, Apple and Fruit Show over at the Emerson-Brantingham Building. I would like to urge you all to go over there and see what a good show we have. We are going to adjourn now in a few minutes and it is only about 4:20, and it is only a little walk over near the railroad, and I would like you all to go. I think you will find it very interesting.

The CHAIRMAN: If there is no more business, we will stand adjourned until to-morrow morning at 9 o'clock.

Wednesday Morning, January 24, 1917, 9:00.

Mr. P. S. Fenstermacher in the Chair.

The CHAIRMAN: I understand that two numbers of yesterday afternoon's program have not been rendered. Is Dr. Dixon in the audience? Has Mr. Weld's report on dairy and dairy products been received?

MR. HUTCHISON: Secretary Patton had a letter from Mr. Weld. He has sickness in his family and it is impossible for him to get here. I was going to bring that letter down this morning to read to the Board, but I forgot it. Mr. Weld was very anxious to be here, but on account of sickness he could not get away; there was no one at home but he and his wife, so he couldn't leave. I presume Mr. Patton will present the letter when he comes.

The CHAIRMAN: Secretary Patton and Dr. Conard not being here, I think it is important to have some secretary to take charge of the minutes.

MR. HUTCHISON: I nominate Dr. Beck.

It was then moved, seconded and carried that Dr. Beck act as Secretary pro tem.

The CHAIRMAN: The first thing on the pogram is the election of officers. I beg to receive the nomination for three Vice-Presidents.

A Member: I would like to nominate a gentleman who has been a member of this association for a number of years. I will, therefore, nominate Louis Piollet from Bradford county.

MR. J. ALDUS HERR: I nominate a gentleman who has taken an active part in the meetings, Mr. John Shoener.

The CHAIRMAN: I would like to nominate Dr. E. E. Tower of Susquehanna county.

It was then moved and seconded and carried that the nominations be closed.

MR. HUTCHISON: I move that the Secretary be directed to cast the vote of this body for the three gentlemen named.

A Member: I second that motion.

The CHAIRMAN: The ballot shows the election of Mr. Louis Piollet, Mr. John Shoener, and Dr. E. E. Tower as Vice-Presidents of the Board.

The next is the nomination of the Executive Committee.

Thereupon, S. S. Blyholder, Dr. M. E. Conard, H. G. McGowan, W. F. Beck, J. P. Young, Matthew Rodgers, P. S. Fenstermacher and C M. Bower were duly nominated as members of the Executive Committee.

The CHAIRMAN: Mr. Barnes just suggests that hereafter in nominating these gentlemen this Committee should be such as their term does not expire next year. I don't know what the roster here says. What do you think of the matter, gentlemen?

MR. SHOENER: Mr. Chairman, this Committee has nothing to do with our next year's meeting, has it?

The CHAIRMAN: I can see no reason why they couldn't be nominated this year if their term expires next year.

It was then moved and seconded and carried that the nominations be closed.

MR. HUTCHISON: I move that the Secretary be directed to cast the vote for the 8 gentlemen named.

Seconded and carried.

The CHAIRMAN: The ballot shows the election of S. S. Blyholder, Dr. M. E. Conard, Hon. H. G. McGowan, Dr. W. F. Beck, J. P. Young, Matthew Rodgers, P. S. Fenstermacher and C. M. Bower.

We usually assemble shortly after this election and appoint the other Committees. The next in order is the election of the place for the Spring meeting. Are you ready to receive the nominations?

MR. BIDDLE: Mr. Chairman, I would be very glad if the Spring meeting could come to Bedford county. We are located in the southern tier, right on the Lincoln Highway; and right in sight of the town of Bedford is the noted Bedford Springs, the Avondale Springs and the Cathedral Springs. It is a great summer resort, where through the summer, a great many people come to spend the time and to recuperate their health. Bedford is a dry town, from a spirituous liquor point of view, but on the other hand, we have plenty of good fresh water and plenty of fresh air, and those of you who have made

agricultural tours through the southern part of the State know that Bedford isn't a bad place to stop at. As to hotel accommodations, we are well and amply fixed to supply the members who will attend the Spring meeting. So I would feel very glad if the spring meeting would come to the Town of Bedford, the historic place.

MR. WAY: Mr. Chairman, I rise to ask for the Spring meeting at DuBois. We have good hotel facilities, and it is a very desirable place to stop.

The CHAIRMAN: Are there any other nominations for this meeting? Hearing of none the motion to close is in order.

It was then moved, seconded and carried that the nominations be closed.

The CHAIRMAN: If you are ready we will proceed to ballot. As the Secretary calls off the counties you will please respond because we have no list of your names here—just a few of them—so we will take it for granted that you are members.

The Secretary then called the counties; Bedford received 18 votes and DuBois 26 votes.

The CHAIRMAN: DuBois has the majority votes and is the place for the next Spring meeting.

MR. BIDDLE: Mr. Chairman, I being from Bedford feel glad in a way that we are going to DuBois, although I would like very well if the Spring meeting could have been at Bedford. I therefore move you that we make DuBois the unanimous choice of the State Board of Agriculture for our Spring meeting.

It was then moved, seconded and carried that DuBois be the unanimous choice of the Board for the next Spring meeting.

The CHAIRMAN: That brings us back to the report of the Standing Committees.

MR. BLYHOLDER: Mr. Chairman, I desire to call a meeting of the Executive Committee in the room in the rear of the hall immediately—now.

A Member: Before you proceed with the program, I want to announce a meeting of the Legislative Committee in the office of the Secretary of Agriculture on Capitol Hill, together with the members who framed the report yesterday on the new bill of the State Board. We met last evening and considered that measure, but it was too voluminous to decide at that time and we saw fit to call this Special Committee to meet with the Legislative Committee so that we might have a joint conference together. As many as can meet the Committee we would like to have with us at 10:30 in the office of the Secretary of Agriculture this morning.

A Member: I wish to announce that there will be a meeting of the Committee on Resolutions in this room at 11:50.

Mr. Studholme in the Chair.

The CHAIRMAN: We will now proceed with the program and call for the Report of the Apiarist, Mr. H. C. Klinger. Is Mr. Klinger present?

MR. HUTCHISON: Mr. Chairman, if you run out of people on your program this morning, fire me in some place—I'll fill a number. I'm on this afternoon.

The CHAIRMAN: We will be glad to call on your report now, Mr. Hutchison.

Mr. Hutchison's report is as follows:

FEEDING STUFFS REPORT

By G. G. HUTCHISON.

As your Specialist on Feeding Stuffs, I beg leave to make the following report of our stewardship for the past year. This has been a year in which there were great demands for all lines of commercial feeds and it is well known to your minds that the price of cereals has increased all over the United States and that the scarcity of the crop in some sections has had its effect as well as the war in Europe, which has taken thousands of bushels of grains from our markets. This has caused manufacturers of commercial feeds to place, upon our markets, larger quantities than during any previous year. A few years ago when our Feeding Stuffs law was first placed upon the statute books, our people had very little knowledge of commercial feeds, in fact the manufacturers had very little idea of the importance of the business that they were engaging in.

At that time the manufacturers prepared their feeds in a very careless manner and gave little thought of the markets that would be theirs in the future. But these conditions have changed. Today the consumers and mixers of commercial feeding stuffs have secured up-to-date machinery and have also installed laboratories in which chemists from our best agricultural colleges are employed. The legitimate mixer of commercial feeds has his material analyzed before he purchases it and after it is mixed according to his formula, by having samples taken and analyzed.

These methods have placed the feed manufacturers on a new platform and our experience is that those who are engaged in the business, as I have just stated, have no trouble in complying with the Feeding Stuffs law of our Commonwealth. Our law has not been contested in the last year and we take great pride in stating that it is looked upon as the best law on the statute books of any state in the Union.

There is an effort being made, at the present time, by the feed manufacturers to have a uniform law passed in the United States. The uniform law, as presented, has some very good points in it and we do not wish to condemn it as a whole. But there are certain points that would conflict with the law, that we have on our statute books in Pennsylvania, that we think would not be beneficial to the consumers of commercial feeds in our Commonwealth. Our law prohibits the use of peanut shucks or hulls and also restricts the amount of fiber that shall be in a feed, that contains oat hulls or oat by-products. It also states that no ground corn cobs shall be mixed, with any feed except in a feed that is derived from corn and then the amount mixed shall not exceed a fiber content of 9.00 per cent. One move that the Feeding Stuffs Manufacturers have taken is the employment of our former Chief Chemist, Professor F. D. Fuller, as a scientific expert in the manufacturing of feeds. This shows that these people are trying to get nearer the scientific compounding of feeds with all indications that the manufacturer is getting nearer the consumer than in years gone by.

The molasses feeds that come into our markets are the greatest sellers that are produced and are bought more by our farmers especially in our dairy sections. We find that these feeds are free from adulteration except in the few cases in the pulverizing of the screenings. There are some whole weed seeds which pass through the pulverizer. When this is a large amount, we have been bringing prosecutions. We insist upon the manufacturers using greater care in their pulverizing the grain screenings.

One of the things that we are trying to impress upon our feed consumers throughout the State, is that they should raise their own alfalfa. As a practical farmer, I cannot see why people should buy alfalfa raised west of the Mississippi River when it can be raised upon the farms of Pennsylvania. Some scientific men claim that it cannot be successfully raised on our farms. This, I think, is a mistake.

In the valley, in which I live, I am safe in saying there are nearly 150 acres of alfalfa and one dairyman stated to me that he had 50 tons of good, clean alfalfa hay in his barn for his dairy cows and I believe that some of his neighbors have more. One dairyman told me that he had alfalfa to feed to his dairy cows most of the year, and he keeps 20 to 25 head. If this can be done on limestone land why cannot all farmers save a large amount of their feed bill by raising alfalfa.

The molasses feeds this year gave us some trouble on account of the low grade of molasses that was used in their preparation. In the middle of the summer, when the temperature was very high, we found a number of these feeds mouldy and in bad condition. Some of them were set aside and not offered for sale. Others were shipped out of the State and sold where the Feeding Stuffs law was not as restrictive as ours. We will say for the manufacturers that they did all they could to meet this condition and it was a case in which the Feed Control Officials had to use good, common sense in enforce-

ment of the Feeding Stuffs law. We might have added a great burden on the manufacturers, but when they took it off of our markets we felt that our people were not suffering any loss at their hands.

There are sent to this office, at various times, samples of adulterants that some feed manufacturers wish to place in their feeds. When these are analyzed and found to be worthless we then refuse to allow feeds to be sold on our markets that contain these adulterants. This is a great safe-guard to protect our people and it also saves us quite an amount of litigation. In the enforcement of the law, we bring prosecutions, the manufacturers of commercial feeds pay the fines for their consumers. In the past year there has not been a fine that has not been paid by the manufacturer. This protects the dealers and saves them from the law. The only sting is in the enforcement of the law that the dealers subject to is that the informations are made against them. But as the cases are misdemeanors and as the feeds are exposed for sale in our own Commonwealth we cannot make the information outside of the State, hence, we are compelled to bring them against the dealers in the State, who offer adulterated feeds for sale. But the number of prosecutions has decreased because of the manufacturers complying with our law, which has become of great benefit to the dealers.

Another means of assisting the dealers in purchasing their feeds has been the bulletin that is compiled by our Chief Chemist and distributed to all of the feed dealers and consumers throughout the Commonwealth. This places in his hands a bulletin that has the analysis, composition and guarantees by the manufacturers of the feeds that are offered in the markets. We find that in all feed stores that we visit that this bulletin is on the desk of the dealer and he states that when a feed salesman visits him to sell a certain variety of feed, he turns to our bulletin and there ascertains whether the salesman is telling him the truth or not.

Another safeguard that is drawn here for the protection of the dealers is that we require the registration of all feeds that are offered for sale in our State. In this registration is given the analysis for protein, fat and fiber and also a statement of the contents of the feed or what it is manufactured from. If the Chief Chemist has any doubt as to the purity of any of the substances entering into the feed, he then requires samples of the feed to be sent by the manufacturer to the Laboratory and he has it analyzed and if it complies with the statement of facts on the registration, the registration is then received. If it does not comply with it the registration is then returned with a statement of what the chemist found. In the past year there has been registered with us over 2,000 brands of feeds. This gives you some idea of the vast amount of different brands of feeds that are sold within our Commonwealth. In the last year the Department has made a request to our feed manufacturers to discontinue the use of a sliding scale in giving their analysis on sacks or packages. This scale as it was, previous to this request, gave the protein on a package running from say, 12.00 to 14.00 per cent. and the fat from 2.00 to 3.00 per cent. and the fiber from 9.00 to 12.00 per cent. This was misleading and the Secretary of Agriculture, the Chief Chemist and myself, after a

conference, decided that it would be better to give the one figure indicating the correct amount of protein, fat and fiber in the goods. Without any litigation, the manufacturers are complying with this request, some of them having to reduce their analysis but yet coming within the law.

There is an organization known as the Feeding Stuffs Control Officials of the United States. This organization is made up of representatives from the different states that have Feeding Stuffs Control. They have what is known as an Executive Committee. To this is referred, among other subjects, the question of definitions. These definitions are not binding on any state but they are a guide not only to the other Feed Control Officials, but to the purchasers of concentrated feeds; and for your information I have here inserted these definitions knowing that this report will go in the annual report and it will reach a great number of persons engaged in the sale of feeding stuffs.

DEFINITIONS OF FEED MATERIALS.

CHOICE COTTONSEED MEAL must be finely ground, not necessarily bolted, perfectly sound and sweet in odor, yellow, free from excess of lint, and must contain at least 41 per cent. of protein.

PRIME COTTONSEED MEAL must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or redish, free from excess of lint, and must contain at least 38.6 per cent. protein.

GOOD COTTONSEED MEAL must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color and must contain at least 36 per cent. protein.

COTTONSEED MEAL is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil; provided that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 36 per cent. of protein.

COTTONSEED FEED is a mixture of cottonseed meal and cottonseed hulls, containing less than 36 per cent. protein.

COLD PRESSED COTTONSEED is the product resulting from subjecting the whole undecorticated cottonseed to the cold pressure process for the extraction of oil, and includes the entire cottonseed less the oil extracted.

GROUND COLD PRESSED COTTONSEED is the ground product resulting from subjecting the whole undecorticated cottonseed to the cold pressure process for the extraction of oil, and includes the entire ground cottonseed less the oil extracted.

OIL MEAL is the ground product obtained after the extraction of part of the oil by crushing, cooking and hydraulic pressure or by crushing, heating and the use of solvents from seeds which have been screened and cleaned of weed seeds and other foreign materials

by the most improved commercial processes. When used alone the term "Oil Meal" shall be understood to designate the product obtained from screened and cleaned flaxseed. When used to cover any other product the name of the seed from which it is obtained shall be prefixed to the words "Oil Meal."

OLD PROCESS OIL MEAL is the ground product obtained after extraction of part of the oil by crushing, cooking, hydraulic pressure from seeds screened and cleaned of weed seeds and other foreign materials by the most improved commercial processes. When used alone the term "Old Process Oil Meal" shall be understood to designate the product obtained from partially extracted, screened and cleaned flaxseed. When used to cover any other product the name of the seed from which it is obtained shall be prefixed to "Old Process Oil Meal."

NEW PROCESS OIL MEAL is the ground product obtained after extraction of part of the old by crushing, heating and the use of solvents from seeds screened and cleaned of weed seeds and other foreign materials by the most improved commercial processes. When used alone the term "New Process Oil Meal" shall be understood to designated the product obtained from partially extracted, screened and cleaned flaxseed. When used to cover any other product the name of the seed from which it is obtained shall be prefixed to "New Process Oil Meal."

LINSEED MEAL is the ground product obtained after extraction of part of the oil from ground flaxseed screened and cleaned of weed seeds and other foreign materials by the most improved commercial processes.

UNSCREENED FLAXSEED OIL FEED is the ground product obtained after extraction of part of the oil from unscreened flaxseed by crushing, cookiug and hydraulic pressure or crushing, heating and the use of solvents. When sold without grinding, the unground product shall be designated as "Unscreened Flaxseed Oil Feed Cake."

DISTILLERS' DRIED GRAINS are the dried residue from cereals obtained in the manufacture of alcohol and distilled liquors. The product shall bear the designation indicating the cereal predominating.

BREWERS' DRIED GRAINS are the properly dried residue from cereals obtained in the manufacture of beer.

MALT SPROUTS are the sprouts of the barley grain. If the sprouts are derived from any other malted cereal, the source must be designated.

CORN BRAN is the outer coating of the corn kernel.

CORN FEED MEAL is the sifting obtained in the manufacture of cracked corn and table meal from the whole grain.

CORN GLUTEN MEAL is that part of commercial shelled corn that remains after the separation of the larger part of the starch, the germ and the bran by the processes employed in the manufacture of cornstarch and glucose. It may or may not contain corn solubles.

CORN GLUTEN FEED is that portion of commercial shelled corn that remains after the separation of the larger part of the starch and the germ by the process employed in the manufacture of cornstarch and glucose. It may or may not contain corn solubles.

GRITS are the hard, flinty portions of Indian corn without hulls and germ.

HOMINY MEAL, HOMINY FEED, OR HOMINY CHOP is a mixture of the bran coating, the germ and a part of the starchy portion of the corn kernel obtained in the manufacture of hominy grits for human consumption.

CORN GERM MEAL is a product of the manufacture of starch, glucose and other corn products and is the germ layer from which a part of the corn oil has been extracted.

RED DOG is a low grade wheat flour containing the finer particles of bran.

SHORTS or STANDARD MIDDLINGS are the fine particles of the outer and inner bran separated from bran and white middlings.

WHEAT WHITE MIDDLINGS or WHITE MIDDLINGS are that part of the offal of wheat intermediate between shorts or standard middlings and red dog.

SHIPSTUFF or WHEAT MIXED FEED is a mixture of the products other than the flour obtained from the milling of the wheat berry.

WHEAT BRAN is the coarse outer coatings of the wheat berry obtained in the usual commercial milling process from wheat that has been cleaned and scoured.

WHEAT BRAN WITH MILL RUN SCREENINGS is pure wheat bran plus the screenings which were separated from the wheat used in preparing said bran.

WHEAT BRAN WITH SCREENINGS NOT EXCEEDING MILL RUN is either wheat bran with the whole mill run of screenings or wheat bran with a portion of the mill run of screenings, provided that such portion is not an inferior portion thereof.

OAT MIDDLINGS are the floury portion of the oat groat obtained in the milling of rolled oats.

OAT SHORTS are the covering of the oat grain lying immediately inside the hull, being a fuzzy material carrying with it considerable portions of the fine floury part of the groat obtained in the milling of rolled oats.

OAT GROATS are the kernels of the oat berry with the hulls removed.

OAT HULLS are the outer chaffy coverings of the oat grain.

CLIPPED OAT BY-PRODUCTS (term oat clippings not recognized) is the resultant by-product obtained in the manufacture of clipped oats. It may contain light, chaffy material broken from the ends of the hulls, empty hulls, light, immature oats and dust. It must not contain an excessive amout of oat hulls.

BUCKWHEAT SHORTS OR BUCKWHEAT MIDDLINGS are that portion of the buckwheat grain immediately inside of the hull after separation from the flour.

ALFALFA MEAL is the entire alfalfa hay ground, and does not contain an admixture of ground alfalfa straw or other foreign materials.

CHOP is a ground or chop feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

SCREENINGS are the smaller imperfect grains, weed seeds and other foreign materials having feeding value, separated in cleaning the grain.

MEAL is the clean, sound, ground product of the entire grain, cereal or seed which it purports to represent:

FLAX PLANT BY-PRODUCT is that portion of the flax plant remaining after the separation of the seed, the bast fibre and a portion of the shives, and consists of flax shives, flax pods, broken and immature flax seeds and the cuticle tissue of the stem.

RICE BRAN is the cuticle beneath the hull.

RICE HULLS are the outer chaffy coverings of the rice grain.

RICE POLISH is the finely powdered material obtained in polishing the kernel.

BLOOD MEAL is ground dried blood.

OIL Cake is the residual cake obtained after extraction of part of the oil by crushing, cooking and hydraulic pressure from seeds screened and cleaned of weed seeds and other foreign materials by the most improved commercial processes. When used alone the term "Oil Cake" shall be understood to designate the product obtained from partially extracted, screened and cleaned flaxseed. When used to cover any other product, the name of the seed from which it is obtained shall be prefixed to "Oil Cake."

GROUND OIL CAKE is the product obtained by grinding oil cake. When used alone, the term "Ground Oil Cake" shall be understood to designate the product obtained from partially extracted, screened and cleaned flaxseed. When used to cover any other product the name of the seed from which it is obtained shall be prefixed to "Ground Oil Cake."

INGREDIENTS OF UNSCREENED FLAXSEED OIL FEED—Ground cake from partially extracted flaxseed and foreign seeds (wheat, wild buckwheat, pigeon grass, wild mustard, etc.).

SCREENINGS OIL FEED is the ground product obtained after extraction of part of the oil by crushing, cooking and hydraulic pressure, or by crushing, heating and the use of solvents from the smaller imperfect grains, weed seeds and other foreign materials having feeding value separated in cleaning the grain. The name of the grain from which the screenings are separated shall be prefixed to "Screenings Oil Feed."

GROUND FLAXSEED OR FLAXSEED MEAL is the product obtained by grinding flaxseed which has been screened and cleaned of weed seeds and other foreign material by the most improved commercial processes.

YEAST OR VINEGAR DRIED GRAINS are the properly dried residue from the mixture of cereals, malt and malt sprouts (sometimes cottonseed meal) obtained in the manufacture of yeast or vinegar, and consist of corn or corn and rye from which most of the starch has been extracted, together with malt added during the manufacturing process to change the starch to sugars, and malt sprouts (sometimes cottonseed meal) added during the manufacturing process to aid in filtering the residue from the wort and serve as a source of food supply for the yeast.

PALM KERNEL OIL MEAL is the ground residue from the extraction of part of the oil by pressure or solvents from the kernel of the fruit of Elaeis guineensis or Elaeis malanococca.

IVORY NUT MEAL is ground ivory nuts.

TENTATIVE DEFINITIONS

CORN FEED MEAL is the by-product obtained in the manufacture of cracked corn, with or without aspiration products added to the siftings, and is the by-product obtained in the manufacture of table meal from the whole grain by the non-degerminating process.

MEAT SCRAP AND MEAT MEAL are the ground residues from animal tissues exclusive of hoof and horn. If they contain more than 10 per cent of phosphoric acid (P_2O_5) they must be designated Meat and Bone Scrap and Meat and Bone Meal. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

DIGESTER TANKAGE is the residue from animal tissue. exclusive of hoof and horn, specially prepared for feeding purposes by tanking under live steam, drying under high heat, and suitable grinding. If it contains more than 10 per cent of phosphoric acid (P_2O_5) it must be designated Digester Meat and Bone Tankage.

PEANUT OIL CAKE is the residue after the extraction of part of the oil by pressure or solvents from peanut kernels.

PEANUT OIL MEAL is the ground residue after the extraction of part of the oil from peanut kernels.

UNHULLED PEANUT OIL FEED is the ground residue obtained after extraction of part of the oil from whole peanuts, and the ingredients shall be designated Peanut Meal and Hulls.

At this Annual Meeting we met with members of the United States Department of Agriculture. They are engaged in the same line of work that our officials are in this State. They gave us the benefit of their work for the year and we also get in touch with men engaged in the feed control from different states. The majority of those who attend this convention from the different states are chemists who are versed in the examination of feeds. For years it has been a great question with those who purchase by-product feeds, what amount of them are digestible.

Some ten years ago I wrote to the Experiment Station of the United States asking if they were running any digestible tests on commercial feeds. I found very few that were interested in this great subject. But as time has rolled on I find that some tests have been made and for your benefit I have inserted in this report a table giving these tests and giving credit to the different persons who have furnished this information. At your leisure I would like you to make an examination of the following table and see if it will not be of some benefit to you:

TABLE IV.—AVERAGE COMPOSITION, DIGESTION, COEFFICIENTS AND ENERGY VALUES OF FEEDING STUFFS.

Name of Feeding Stuffs.	Composition.						Digestion Coefficients.				
					Carbohydrates.				Carbohydrates.		
	Water.	Ash.	Protein.	Fat.	Fiber.	Nitrogen — free extract.	Protein.	Fat.	Fiber.	Nitrogen — free extract.	Therms of energy.
	%	%	%	%	%	%	%	%	%	%	
Alfalfa meal,	8.4	7.4	14.3	2.2	25.0	42.7	74	41	....	*57	34.41
Barley,	10.9	2.4	12.4	1.8	2.7	69.8	70	89	50	92	80.75
Barley meal,	11.9	2.6	10.5	2.2	6.5	63.3	70	89	....	*90	.....
Barley screenings,	12.2	3.6	12.3	2.8	7.3	61.8	....	....	....	.....	.....
Beet pulp, dried,	8.0	5.4	9.5	0.4	15.4	61.3	64	....	....	*89	60.10
Brewers' dried grains,	8.2	3.6	19.9	5.6	11.0	51.7	79	91	53	59	60.01
Broom corn seed,	12.7	2.4	10.2	3.0	7.1	63.6	73	97	....	*68	.....
Buckwheat,	12.6	2.0	10.0	2.2	8.7	64.5	77	82	....	*67	.....
Buckwheat bran.	10.5	3.0	12.4	3.3	31.9	38.8	60	58	....	*43	.....
Buckwheat hulls,	13.2	2.2	4.6	1.1	43.5	35.3	46	55	....	*35	.....
Buckwheat middlings,	13.2	4.8	28.9	7.1	4.1	41.9	76	76	....	*73	75.92
Buckwheat shorts,	11.1	5.1	27.1	7.6	8.3	40.8	78	72	....	*68	.....
Cocoa hulls,	4.5	13.9	18.5	3.5	16.7	42.9	12	100	51	73	.....
Cocoanut oil cake meal,	10.3	5.9	19.7	11.0	14.4	38.7	79	95	....	*72	.....
Cocoanut shells, ground,	8.7	0 6	1.3	0.4	49.5	39.5	....	....	....	.....	.....
Corn,	10.9	1.5	10.4	5.0	2.0	70.2	76	86	58	93	88.84
Corn bran,	9.1	1.3	9.0	5.8	12.7	62.0	82	79	....	*80	.....
Corn cob,	10.7	1.4	2.4	0.5	30.1	54.9	17	50	65	60	.....
Corn and cob meal,	15.1	1.5	8.5	3.5	6.6	64.8	52	84	45	88	72.65
Corn germ meal,	8.1	1.3	11.1	7.1	9.9	62.5	81	87	....	*55	.....
Corn gluten feed,	8.5	1.7	26.2	3.1	7.2	53.3	85	83	72	87	79.52
Corn gluten meal,	8.2	0.9	29.3	11.8	3.3	46.5	88	93	....	*87	88.80
Corn meal.	15.0	1.4	9.2	3.8	1.9	63.7	60	92	....	*93	.....
Corn oil cake meal.	7.5	2.5	28.0	11.5	7.4	43.1	....	....	....	.....	.....
Cottonseed,	10.3	3.5	18.4	19.9	23.2	24.7	68	87	76	50	.....
Cottonseed hulls,	11.1	2.8	4.2	2.2	46.3	33.4	71	77	....	*42	.....
Cottonseed meal,	7.6	7.2	41.0	8.1	9.2	26.9	88	93	32	64	84.20
Distillers' dried grains (from corn),	6.4	1.7	30.4	12.7	11.0	37.8	73	95	....	*85	79.23
Distillers' dried grains (from rye),	6.8	1.8	18.8	8.4	13.2	51.0	60	....	....	.....	69.93
Dried blood,	8.5	4.7	84.3	2.5	.....	.....	72	92	....	.....	.....
Fish scrap,	10.8	29.2	48.4	11.6	.....	.....	91	89	....	.....	.....
Flaxseed,	9.2	4.3	22.6	33.7	7.1	23.2	91	86	61	55	.....
Flaxseed screenings,	5.3	11.7	17.2	15.7	11.1	39.0	....	....	....	.....	.....
Flax plant refuse,	5.9	6.9	6.8	3.6	42.6	34.2	....	....	....	.....	.....
Hominy feed,	11.1	2.5	9.8	8.3	3.8	64.5	77	82	....	*81	84.00
Ivory nut meal,	8.2	1.2	4.7	0.9	8.2	76.8	....	....	....	.....	.....
Kaffir corn,	9.3	1.5	9.9	3.0	1.4	74.9	79	70	....	*75	.....
Linseed oil meal (new process),	10.1	5.8	33.2	3.0	9.5	38.4	85	93	74	88	74.67
Linseed oil meal (old process),	9.2	5.7	32.9	7.9	8.9	35.4	89	89	57	78	78.92
Malt sprouts,	10.2	5.7	23.2	1.7	10.7	48.5	80	100	34	69	46.32
Meat scraps,	10.7	4.1	71.2	13.7	.....	0.3	93	98	....	.....	.....
Millet seed,	14.0	3.3	11.8	4.0	9.5	57.4	75	80	....	*67	.....
Molasses (cane blackstrap),	22.4	9.3	2.4	.....	.....	65.9	....	....	....	66	.....
Molasses (beet),	20.8	10.6	9.1	.....	.....	59.5	....	....	....	60	.....
Oats,	11.0	3.0	11.8	5.0	9.5	59.7	78	83	20	76	66.27
Oat bran,	7.1	5.4	12.4	5.5	16.7	52.9	....	....	....	.....	.....
Oat clips,	6.7	11.5	9.4	3.8	21.3	47.3	....	....	....	.....	.....
Oat hulls,	7.3	6.7	3.3	1.0	29.7	52.1	39	60	....	*48	.....
Oat shorts,	7.7	3.7	16.0	7.1	6.1	59.4	78	29	....	*72	.....
Pea meal,	10.0	2.6	18.9	1.6	17.5	49.4	83	56	....	*76	71.75
Peanut bran,	9.6	3.5	17.1	25.4	10.6	33.8	....	....	....	.....	.....
Peanut hulls,	9.0	3.4	6.6	1.6	64.3	15.1	71	91	....	*50	.....
Peanut meal,	10.7	4.9	47.6	8.0	5.1	23.7	90	86	....	*79	.....
Rice,	12.4	0.4	7.4	0.4	0.2	79.2	65	75	....	*91	.....
Rice bran,	9.7	10.0	12.1	8.8	9.5	49.9	44	83	....	*76	.....
Rice hulls,	9.0	18.3	3.5	0.5	41.9	26.8	23	40	...	*21	.....
Rice meal,	10.2	8.1	12.0	13.1	5.4	51.2	63	85	26	86	.....

TABLE IV—*Concluded.*

Name of Feeding Stuffs.	Composition.						Digestion Coefficients.				Therms of energy.
					Carbohydrates.				Carbohydrates.		
	Water.	Ash.	Protein.	Fat.	Fiber.	Nitrogen — free extract.	Protein.	Fat.	Fiber.	Nitrogen — free extract.	
	%	%	%	%	%	%	%	%	%	%	
Rice poiisb,	10.0	6.7	11.7	7.3	6.3	58.0	77	89	....	*8	.....
Rye,	11.6	1.9	10.6	1.7	1.7	72.5	93	65	....	*91	81.72
Rye bran,	11.6	3.6	14.7	2.8	3.5	63.8	78	71	....	*75	56.65
Rye shorts,	9.3	5.9	18.0	2.8	5.1	59.9	66	57	....	*69	.....
Soja (Soy) bean seed,	10.8	4.7	34.0	16.9	4.8	28.8	87	85	....	*66	.....
Sorgbum seed,	12.8	2.1	9.1	3.6	2.6	69.8	77	86	....	*72	.....
Sunflower oii cake,	10.8	6.7	32.8	9.1	13.5	27.1	95	97	....	*48	.....
Sunflower seed,	8.6	2.6	16.3	21.2	29.9	21.4	74	89	....	*41	.....
Tankage,	7.0	18.7	44.1	13.6	7.2	9.4	....	....	....	.....	.....
Wheat,	10.5	1.8	11.9	2.1	1.8	71.9	86	81	....	*94	82.63
Wheat bran,	11.9	5.8	15.4	4.0	9.0	53.9	79	68	22	69	48.23
Wheat iow grade flour middiings,	12.0	2.0	18.0	3.8	0.9	63.3	46	24	....	*98	.....
Wheat middiings,	11.6	2.9	12.5	3.0	4.9	65.1	78	73	....	*73	.....
Wheat screenings,	11.6	2.9	12.5	3.0	4.9	65.1	78	73	....	*73	.....
Wheat shorts,	11.8	4.6	14.9	4.5	7.4	56.8	82	84	....	*78	.....
Yeast dried grains,	6.8	3.7	20.3	7.8	17.4	44.0	....	....	....	.....	.....
Roughage.											
Bariey straw,	14.2	5.7	3.5	1.5	36.0	39.0	20	42	56	54	.....
Buckwheat straw,	9.9	5.5	5.2	1.3	43.0	35.1	....	....	....	.....	.....
Canada blue grass,	14.0	4.8	5.9	0.9	32.3	42.1	42	33	....	*65	.....
Clover hay, alsike,	9.7	8.3	12.3	2.9	25.6	40.7	66	50	53	71	.....
Clover hay, crimson,	9.6	8.6	15.2	2.8	27.2	36.6	69	44	45	62	.....
Ciover hay, red,	15.3	6.2	12.3	3.3	24.8	38.1	49	43	48	58	24.74
Corn fodder,	42.2	2.7	4.5	1.6	14.3	34.7	55	74	65	73	12.44
Corn silage,	79.1	1.4	1.7	0.8	6.0	11.0	53	87	....	*66	16.56
Corn stover,	40.5	3.4	3.8	1.1	19.7	31.5	45	62	67	61	26.53
Kentucky blue grass hay,	21.2	6.3	7.8	3.9	23.0	37.8	62	51	....	*61	.....
Oat straw,	9.2	5.1	4.0	2.3	37.0	42.4	30	33	54	44	21.21
Orchard grass hay,	9.9	6.0	8.1	2.6	32.4	41.0	60	54	....	*58	.....
Red top hay,	8.9	5.2	7.9	1.9	28.6	47.5	61	53	....	*62	.....
Rye straw,	7.1	3.2	3.0	1.2	38.9	45.6	21	32	60	37	20.87
Timothy hay,	13.2	4.4	5.9	2.5	29.0	45.0	48	57	52	59	33.56
Wheat straw,	9.6	4.2	3.4	1.3	38.1	43.4	11	31	52	38	16.56

Above figures from W. A. Henery's "Feeds and Feeding," W. H. Jordan's "The Feeding of Animals," J. E. Hallingan's "Stock Feeds and Feeding," Builetin No. 114, Penna. Experiment Station, Bulietin No. 152, Mass. Experiment Station, Farmers' Builetin No. 346, U. S. Dept. of Agriculture and Feeding Stuffs reports of Penna. Department of Agriculture.

*Digestion co-efficients for carbohydrates (nitrogen-free extract and crude fiber estimated together.)

I hope to see the day that some of the Experimental Stations will take up the question of the digestibility of commercial feeds. Our own Station has been conducting digestible tests on ground cereals but do not give as much attention, I think, to this great subject of the commercial feeds as should be given. This is not a criticism, it is only a suggestion. I am glad to see that some of the Stations are giving some attention to the question of proprietary calf meals. I received a bulletin a few days ago from one of the stations giving a large number of experiments. This I was delighted to see as it will be of great benefit to those engaged in raising calves in which they do not have the milk supply that they should have. The Proprietary Poultry Foods that are upon the market are the ones in which the people should take a great interest. I am not here to condemn them. I know they have a place on our markets, but the price that they command is the question that should enter into their consumption.

Before, in speaking of this question, I advocated the use of good, clean, red wheat. But as wheat has gotten to a price ranging from $1.80 to $1.90 a bushel, to some it might work as prohibitory. But if you will take the increase in price of poultry foods you will find that they increase in the proportion of the price of wheat. Now if the manufacturers of poultry foods would use good, clean wheat in their foods they would be entitled to the same increase. But when they use a cheap grade of wheat or a grade of wheat that has been damaged then they should not receive the same proportion of increase that they do. We have endeavored throughout the year to keep the whole weed seeds out of the chicken feeds and we have been successful except in a few cases. Some of the manufacturers sell a nice, clean chicken feed made up of wheat, corn, cracked corn and other cereals, but a few will persist in mixing almost any refuse together and calling it a chicken feed.

In the rearrangement of our work last year by Secretary Patton we have had two men taking samples of feeding stuffs and visiting the dealers throughout the State the last year. Part of their time is taken up with the fertilizer work, a portion with the paint, seed and lime work, and the balance securing feeding stuffs work.

To Mr. John F. St. Clair there were assigned thirty-nine counties of the State, part of which is in the central and balance in the western part of Pennsylvania, and to Mr. W. John Stiteler, twenty-eight counties, including the eastern and portion of the middle section of the State. These gentlemen have given their very best effort to this work and have been faithful in distributing information, by answering questions in regard to the law and explaining it to the dealers, securing the names of dealers that wished our bulletins and in securing samples. Mr. Stiteler, in the twenty-eight counties assigned to him, secured 679 samples, which were forwarded to the Laboratory for analysis. He also visited a large number of dealers, in which he did not take samples as it would be a duplication. He also spent about six weeks in Philadelphia on special investigation, on the feeds that were coming into that market. This investigation proved very profitable to the Department, and was a means of furnishing information to those engaged in the sale of concentrated feeds in Philadelphia.

In the thirty-nine counties that Mr. St. Clair visited, he secured 618 samples. This covered all of the various kinds of feeds that are on the markets. He also visited a large number of places in which he did not take samples as it would be a duplication.

In these gentlemen's reports they state that the dealers are enthusiastically in favor of the Feeding Stuffs law. I want to hear publicly thank these two faithful agents for the manner in which they have discharged their duties in the last year. I here give the the table giving the towns visited by Mr. St. Clair in his work:

(St. Clair).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Adams,	Gettysburg,	5	
	New Oxford,	7	
	Idaville,	0	
	Biglerville,	0	
	Total,		12
Allegheny,	Pittsburgh,	12	
	Pitcairn,	4	
	Braddock,	2	
	McKeesport,	7	
	Wilkinsburg,	5	
	Etna,		
	Sharpsburg,	3	
	Oakdale,	1	
	Castle Shannon,	4	
	Homestead,	2	
	Homestead No. 1,	3	
	Turtle Creek,	3	
	Hays,	4	
	Carnegie,	0	
	East Liberty,	0	
	Tarentum,	0	
	Bridgeville,	0	
	Duquesne,	0	
	Wilmerding,	0	
	Total,		50
Armstrong,	Leechburg,	5	
	Vandergrift,	0	
	Kittanning,	14	
	Ford City,	0	
	Parkers Landing,	0	
	Kelly,	0	
	Templeton,	0	
	Total,		19
Beaver,	Rochester,	6	
	Beaver Falls,	4	
	Monaca,	6	
	New Brighton,	6	
	West Bridgewater,	3	
	Freedom,	3	
	Aliquippa,	0	
	Woodlawn,	0	
	Total,		28

(St. Clair—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Bedford,	Bedford,	8	
	Everett,	1	
	Saxton,	0	
	Hopewell,	0	
	Hindman,	0	
	Total,		9
Blair,	Bellwood,	3	
	Tyrone,	6	
	Altoona,	24	
	Hollidaysburg,	3	
	Martinsburg,	0	
	Roaring Springs,	0	
	Total,		36
Butler,	Evans City,	4	
	Harmony,	4	
	Mars,	4	
	Butler,	9	
	Marwood,	0	
	Euclid,	0	
	Valencia,	0	
	Zelienople,	0	
	Isle,	0	
	Chicora,	0	
	Sarver,	0	
	Total,		21
Cameron,	Emporium,	4	
	Driftwood,	0	
	Total,		4
Cambria,	Johnstown,	27	
	Barnesboro,		
	Ebensburg,	2	
	Spangler,	3	
	South Fork,	0	
	Portage,	0	
	Cresson,	0	
	Patton,	0	
	Carrolltown,	0	
	Wilmore,	0	
	Gallitzin,	0	
	Hastings,	0	
	Total,		32
Center,	Bellefonte,	3	
	Howard,	3	
	Philipsburg,	13	
	Center Hall,	0	
	Unionville,	0	
	Total,		19
Clarion,	Clarion,	8	
	New Bethlehem,	0	
	Summerville,	0	
	Total,		8

(St. Clair—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Clearfield,	DuBois,	8	
	Clearfield,	5	
	Morrisdale,	1	
	Osceola Mills,	0	
	Munson,	0	
	Madera,	0	
	Total,		14
Clinton,	Lock Haven,	8	
	Mill Hall,	0	
	Renovo,	0	
	Total,		8
Crawford,	Linesville,	5	
	Meadville,	0	
	Jamestown,	0	
	Stoneboro,	0	
	Total,		5
Cumberland,	Shippensburg,	2	
	Newville,	3	
	Mechanicsburg,	8	
	Carlisle,	8	
	Mt. Holly Springs,	6	
	Middlesex,	0	
	Total,		27
Elk,	St Marys,	8	
	Ridgway,	4	
	Johnsonburg,	0	
	Total,		12
Erie,	Erie, Wesleyville, Bellevalley,	15	
	Union City,	0	
	Corry,	0	
	North Girard,	0	
	Total,		21
Fayette,	Connellsville,	2	
	Dunbar,	1	
	Fairchance,	4	
	South Brownsville,	2	
	Uniontown,	10	
	Bellevernon,	2	
	Brownsville,	0	
	Masontown,	0	
	Total,		21
Forest,	Tionesta,	3	
	Hickory,	0	
	Total,		3
Franklin,	Chambersburg,	11	
	Williamson,	5	
	Marion,	0	
	Greencastle,	0	
	Lehmaster,	0	
	Mercersburg,	0	
	Fort Louden,	0	
	Scotland,	0	
	Total,		16

(St. Clair—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Fulton,	McConnellsburg,		1
Greene,	Waynesburg,	1	
	Rice's Landing,	0	
	Total,		1
Huntingdon,	Huntingdon,	8	
	Mapleton,	4	
	Mt. Union,	0	
	Petersburg,	0	
	Total,		12
Indiana,	Homer City,	5	
	Indiana,	5	
	Clymer,	0	
	Ernest,	0	
	Creekside,	0	
	Blairsville,	0	
	Saltsburg,	0	
	Black Lick,	0	
	Total,		10
Jefferson,	Brookville,	7	
	Lindsey,	1	
	Reynoldsville,	6	
	Punxsutawney,	3	
	Sykesville,	0	
	Prescottville,	0	
	Big Run,	0	
	Falls Creek,	0	
	Brockwayville,	0	
	Total,		17
Juniata,	Mifflin,	2	
	Port Royal,	0	
	Total,		2
Lawrence,	New Castle,	15	
	Ellwood City,	4	
	New Wilmington,	0	
	Mahoningtown,	0	
	Total,		19
Mercer,	Greenville,	2	
	Sharon,	4	
	Farrell,	6	
	Pulaski,	0	
	Wheatland,	0	
	West Middlesex,	0	
	Mercer,	0	
	Grove City,	0	
	Total,		12
Mifflin,	Lewistown,	2	
	Yeagertown,	6	
	McVeytown,	2	
	Reedsville,	0	
	Total,		10

(St. Clair—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
McKean,	Bradford,	12	
	Kane,	7	
	Smethport,	8	
	Port Allegany,	2	
	Eldred,	0	
	Mt. Jewett,	0	
	Total,		29
Perry,	Millerstown,	2	
	Newport,	4	
	Duncannon,	0	
	Marysville,	0	
	Total,		6
Potter,	Coudersport,	6	
	Ulysses,	0	
	Total,		6
Snyder,	Middleburg,	0	
	Selinsgrove,	0	
	Swineford,	0	
	Total,		0
Somerset,	Windber,	8	
	Somerset,	11	
	Rockwood,	2	
	Holsopple,	0	
	Meyersdale,	0	
	Total,		21
Union,	Mifflinburg,	4	
	Lewisburg,	8	
	West Milton,	0	
	Total,		12
Venango,	Oil City,	4	
	Franklin,	4	
	Silverly,	0	
	Polk,	0	
	Total,		8
Warren,	Warren,	5	
	Youngsville,	0	
	Columbus,	0	
	Total,		5
Washington,	Midway,	4	
	California,	2	
	Monongahela,	6	
	Fredericktown,	5	
	Charleroi,	3	
	Washington,	15	
	Donora,	0	
	Canonsburg,	0	
	Huston,	0	
	Total,		35

(St. Clair—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Westmoreland,	Vandergrift,	0	
	New Kensington,	4	
	Greensburg,	5	
	Latrobe,	5	
	Manor,	3	
	Mt. Pleasant,	2	
	Scottdale,	4	
	New Stanton,	3	
	Parnassus,	6	
	Monessen,	6	
	Jeanette,	8	
	Derry,	2	
	Irwin,	2	
	Vandergrift Heights,	3	
	New Salem,	0	
	Tarrs,	0	
	Penn,	0	
	Bolivar,	0	
	Total,		53

I here give the table giving the towns visited by Mr. Stiteler in his work:

(Stiteler).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Bradford,	Troy,	7	
	Canton,	8	
	Sayre,	2	
	Athens,	2	
	Towanda,	19	
	New Albany,	3	
	Total,		41
Bucks,	Sellersville,	9	
	Doylestown,	8	
	Quakertown,	14	
	Chalfonte,	3	
	Perkasie,	7	
	South Perkasie,	3	
	Total,		44
Chester,	Paoli,	7	
	Berwyn,	6	
	Coatesville,	15	
	Malvern,	8	
	Pomeroy,	1	
	Toughkenamon,	3	
	Oxford,	3	
	Chadds Ford Junction,	2	
	West Chester,	11	
	Honeybrook,	3	
	Downingtown,	3	
	Total,		65
Columbia,	Bloomsburg,		1
Delaware,	Wayne,	8	
	Rosemont,	4	
	Chadds Ford,	0	
	Brandywine Summit,	0	
	Total,		12
Lackawanna,	Scranton,	21	
	Carbondale,	8	
	Total,		29
Lancaster,	Florin,	1	
	Leola,	2	
	Terre Hill,	1	
	Lancaster,	14	
	Witmer,	2	
	Bird-in-hand,	2	
	Christiana,	2	
	Royerstown,	2	
	Total,		26
Lebanon,	Annville,	1	
	Prescott,	1	
	Lawn,	1	
	Lebanon,	4	
	Total,		7

(Stiteler—Continued).

County Visited.	Towns Visited.	Number of Samples Collected.	Total Number Collected.
Lehigh	Allentown	7	
	Emaus	3	
	Coopersburg	3	
	Centre Valley	0	
	South Bethlehem	5	
	Total		18
Luzerne	Wilkes-Barre	21	
	Ashley	0	
	Edwardsville	0	
	Total		21
Lycoming	Williamsport	8	
	Montoursville	3	
	Total		11
Montgomery	Lansdale	12	
	Colmar	5	
	West Point	7	
	Telford	7	
	Souderton	2	
	North Wales	1	
	Hatfield	9	
	Total		43
Monroe	Stroudsburg	5	
	East Stroudsburg	7	
	Total		12
Northampton	Bethlehem	4	
	Easton	14	
	Total		18
Northumberland	Sunbury	12	
	Northumberland	0	
	Total		12
Philadelphia	Philadelphia		0
Sullivan	Dushore		1
Susquehanna	Montrose	12	
	Hopbottom	4	
	Brooklyn	0	
	Total		16
Tioga	Wellsboro	15	
	Knoxville	6	
	Westfield	7	
	Elkland	3	
	Tioga	5	
	Mansfield	6	
	Total		42
Wayne	Honesdale	10	
	Hawley	2	
	Total		12
Wyoming	Meshoppen	0	
	Laceyville	6	
	Skinners Eddy	8	
	Tunkhannock	6	
	Total		20
York	Dillsburg		0

A large number of special samples have been sent to the Department for analysis in the last year. As you recall the law provided that where a citizen of the Commonwealth wishes to have an analysis made of feeding stuffs they then have the same made at the Department of Agriculture by sending the sample together with a fee of $1.00. This fee goes into the State Treasury and the Department is in no way benefitted by it.

This has been a year of progress in the Laboratory. We are now situated on North Street, in the new Capitol Park zone in what is known as the Day School Building. The Laboratories have been fitted up not only to do the work required under the Commercial Feeding Stuffs law, but also to make the analyses of Fertilizers, Paints, Oils, Seeds, and Lime, as required under the different acts of Assembly, and with all the room that we seemed to have had at the beginning, the work that has been placed upon us by the Legislature under these different acts of Assembly, has so increased the labors of the Department that we find that we are now crowded for space. We would be very much pleased to have not only the members of the Board but also visitors to visit the Laboratory and see the plant in working order. There are thirteen persons employed, all doing their very best along this line of work. We hope to see the day that the Commonwealth of Pennsylvania will erect a Laboratory building large enough to accommodate the work that has been placed upon the Department under the different laws.

Because of the fact that the appropriations for all lines of work were less than necessary to properly carry out the provisions of the various control laws, I will call the attention of the Legislative Committee of the Board for the need of increased appropriations, not only for feeding stuffs but for the other lines of work.

I want to thank the members of this Board for the support that they have given us in our labors in their different localities, and say to you and through you to your friends that if you will adopt the text that we laid down to you in the beginning of our labors in this bureau, to buy feed on its high protein, high fat and low fiber analyses, that our labors will not be in vain.

Thanking Secretary Patton and our Chief Chemist, Mr. Kellogg, and all those connected with our work for their many kindnesses throughout the year.

The CHAIRMAN: Gentlemen, you have heard this report—what is your wish in regards to it?

It was then moved, seconded and carried that the report be accepted and placed on file.

A Member: Mr. Chairman, I would like to offer a resolution or raise a suggestion at this time, if it is not out of order. Inasmuch as we have had with us for a number of years a gentleman who is, I believe, yet a member of the State Board of Agriculture, one of the oldest members of the State Board now living, and realizing his absense at this time, I think it would only be just and right that this Board would direct the Secretary of Agriculture, Mr. Patton, to send a telegram of regret to our honored co-worker and member, Joel A. Herr of Clinton county. I offer this as a suggestion.

It was then moved, seconded and carried that a telegram of regret be sent to Joel A. Herr.

MR. HUTCHISON: Mr. Chairman, I see we have with us this morning our former Secretary, Hon. N. B. Critchfield, and I know you will be glad to have a word from him, and we would all like to look him in the face once more. If you will just come up here, Brother Critchfield, and tell us how things are going— a little class meeting like, Brother Critchfield.

MR. CRITCHFIELD: Mr. Chairman, and Gentlemen of the State Board of Agriculture: I have come out here in response to this summary call, not because I have anything to say, not because I want to make a speech, but I simply want to be where I can see you all in the faces which gives me pleasure.

My mind runs back twenty-eight years—twenty-nine years ago this month, I came to Harrisburg with credentials from the Agricultural Society of my own county to take a seat in this Board. I don't think there is any one here that was at that meeting. We met up at the old Supreme Court room—that was my first meeting. There is but one member of the Board who has continued his membership successively until the present time that was a member then and who is living to day. His name was mentioned by the gentleman from York county a few minutes ago, Joel A. Herr. He is the only member of the Board at the present time who was a member when I came into the Board twenty-eight years ago this month. A great many who were associated with us, with the Board at that time, have gone to their reward and we who have taken their places, or you who have taken their places, I have no doubt realize the responsibility that is resting upon you. You are in a great work, a good work, a work that is not only intended to do well or to do good for the present generation but to those who will follow you. You gentlemen are the only men who can claim the dignity of being called to be fellow-laborers with the Divine Father Himself in the work that he is doing. He has called you to work with Him in taking care of His creatures and it is well that you should feel the responsibility that is upon you. He has given to you the land, the soil, the rain and the sunshine. He has given you the health that you need to engage in your work and He tells you to go forth under His direction and turn up the waiting soil and put the seed in the ground, gather your harvest, and prepare it for the sustenance and support of His creatures. You are the only class of people that the good Father of all has taken into partnership with Himself and you ought to appreciate this.

The position of the farmer, I believe, is greater than the position of a King, and I hope that you all realize the responsibility that is resting upon you. We will have our work to do—some of us I have no doubt realizes that our work is pretty nearly done; some of us are turning our faces toward the setting sun and watching for the glow upon the clouds reflected from the face of a reconciled Master who has led us into this great work for humanity.

I am glad to be with you again. If I had the strength and the time I should like to talk to you longer, but I do appreciate this opportunity of coming out here and looking you all in the faces once again. I thank you. (Applause).

A Member: Mr. Chairman, I feel that perhaps at this time the members of the State Board of Agriculture would appreciate a word from the bedside of one of your fellow members, Mr. Herr. I visited him last week at his home at Millhall and thought, perhaps, that you would be glad to hear a word direct from him. Mr. Herr informed me during my visit that he was elected a member in the year 1879, which would give him a direct connection with it for a period of almost 39 years. I found him to be remarkably well under the circumstances, and he said to me that he would be glad if I would say to the members of the State Board of Agriculture of this State he hoped that he would sometime in the near future be able to meet with you. He is being wheeled about in a chair now, of course, and one side is partially paralyzed, yet his mind is absolutely clear and I found him very much interested in your work and the work of our Department. I thought, perhaps, you would like to hear this statement as coming directly from Mr. Herr as recently as less than one week ago.

MR. CAROTHERS: The Secretary has handed me letters from Dr. C. H. DeWitt, Mr. Brong and Mr. Weld explaining the reasons why they could not be here. He thought it proper to have them read to you.

Letters from Dr. DeWitt, Mr. Brong and Mr. Weld were read.

The CHAIRMAN: We will now have the Report of the Economic Geologist, Prof. Baird Halberstadt.

Prof. Halberstadt's report is as follows:—

REPORT OF THE ECONOMIC GEOLOGIST

By BAIRD HALBERSTADT, F. G. S.

During the year just closed, there have been but few samples of rocks and minerals sent to me by the farmers of the State for examination. Such as have been submitted have been of little or no economic importance. Each, however, has been carefully examined, and a report on its nature and value has been promptly sent to the sender. Perhaps, some were disappointed, but we can only report on what we find and not on what we would like to have found.

Instead of a purely technical report, I will ask an indulgence for a few minutes, in order to lay before you some observations that I have made in the nine successive terms that I have served as one of your Consulting Specialists. These are not the observations of a trained practical farmer but rather of a layman, who is deeply in-

terested in the welfare of the farmers of the Commonwealth and in improvement in the methods pursued upon the farms of this and other states.

During these terms, I have experienced much pleasure and hope I have profited through my association with you and the farmers of this and other states. It has been my good fortune to have met many farmers; some of these men had attained success and had retired to private life with a competence. Others were men, who had fairly held their own; still others who were rank failures as farmers. Some of these were men of education and refinement; others were men, who in early life had been deprived of educational advantages but by reading and studying had, through their own efforts, educated themselves. Again, I have met farmers, who neither had nor cared for an education, for they lacked the ambition to succeed in any calling. It has also been my pleasure to have met students and professors from the Agricultural Schools and Colleges, also agriculturists from the cities, who expend annually large sums of money in gratifying their whims and fancies, one of which seems to be possession of a farm. As the farms of many of these men seems to reflect the men themselves, I have naturally seen farms of many kinds, under many conditions and under different systems of management and mismanagement. It will be observed that the experiences have been rather broad.

The same diversity which characterizes the farming class is found in every calling, trade or profession, for in each will be found good, indifferent and poor workers. To this rule, the farmer is not an exception. "Agriculture," said the immortal Washington, "is the most healthful, the most useful and the most noble employment of man." Washington was himself a farmer and delighted more in the superintendence of his farms in Virginia, than he did in following the pursuits of a soldier and statesman. He had experience in all these callings and was, therefore, well qualified to judge. Certainly he was right, for no healthier place can be found than on a farm, where correct sanitation is observed. No occupation could be more useful or nobler than that of providing for the wants of his fellow-man.

Does the average farmer of to-day appreciate the importance of his vocation? Does he place himself and his work on the high plane he should, and does he think for a moment, that upon the farmers of the world depends the very existence of the human race? Have you ever considered what would happen, if every farmer, farm laborer and those having but a smattering knowledge of a farming were to suddenly die? Such an occurrence would cause the most terrible calamity imaginable, for the starvation of millions and millions would inevitably follow. Do you feel fully the responsibilities that have been placed upon you, and how utterly helpless the whole world would be without your knowledge and your labors?

Because of these conditions, the farmer is the most needed of all the workers of the world and the profession; profession I say, not trade, for farming in the near future, if not to-day, will have to be carried on by men skilled in science, for there is neither trade nor profession, that involves probably so many problems that can be solved only through the aid of science, as does agriculture. Time

was, when the skill and learning which will be necessary in the future were not required, for the soil was virgin nor was competition so keen. In those days, vast expenditures for artificial or commercial fertilizers were unheard of, nor had the Colorado beetle yet invaded this section, San Jose, the Oyster shell and Scurfy scales were unknown. Spraying fruit trees and potato vines was a thing unknown fifty years ago, because it was, as far as the farmers of that day knew, unnecessary. The pests with which you have to contend to-day had not yet been imported. If they existed here, their presence was not known, and it was not until the destruction wrought by them became so serious, from a financial standpoint, that measures were taken to eradicate or crush them out.

The farmer, in those days, took out most of the elements of fertility, and when the land failed to produce satisfactory crops, he cleared more ground rather than attempt to restore the fertility of the worked out portion. Land in those days was cheap and that could be done but it is not so to-day. I have alluded to the fact, that the farmer of to-morrow to succeed, will have to acquire a greater knowledge of science than the farmer of today, and the reason for it is this: He will have far harder conditions to contend with than those of the past.

Now before going on, let me say to you, that science is looked upon far too lightly by too many. What is science? Knowledge of the truth: "Knowledge of the true, the real, the explained and the comprehended." The real scientist has but the utmost contempt for those who possess little or no knowledge but who pose as learned men and women. That class, who write articles or books upon subjects of which they know nothing and which being read by people in search of learning, so disgusts them, because of their silliness, that they, unfortunately, include, in their condemnation, men, who, after years of training and research, are worthy of recognition.

There is probably no calling, trade or profession that calls for a wider range of knowledge than that of the farmer. I do not mean that he is required to be an expert or a master in each branch of trade but he must or should have some acquaintance with many of them. The work of a farmer involves work along many lines, and while the city dwellers can assign much, if not all of this work to mechanics, the isolated position or remoteness of the farm from the towns and cities, however, makes it often necessary for the farmer to perform the work himself.

We assume now that he understands the work of tilling the soil, which in itself is a trade, but that is but one branch. A farmer must know something of carpentry, so that he can do the odd jobs or erect buildings. Of blacksmithing, he must know enough so as to make repairs quickly, even if only temporary ones. He must know something of the trade of wheelwright or lose much time. Modern farm machinery is coming into such general use and, as many of them are more or less intricate, some knowledge of machinery is very necessary, and the farmer who can dismantle, make repairs to and reassemble his machines, will save not only the money cost but time, and an hour at certain times is worth as much as a day at others on the farm. Thus, it will be seen that some knowledge of the machinist's trade is necessary or at least useful.

Electricity is destined, no doubt, to play an important part on the farm in the near future. I visited one farm in Schuylkill county where much of the work and all the lighting is done by electricity. The presence of various insects and scales requires the farmer to know how to recognize them, so some knowledge of entomology is very useful, if not absolutely necessary. The treatment of the soil of the fields, the preparation of washes for the eradication of pests and the home mixing of fertilizers involves some knowledge of chemistry. To know thoroughly how plants grow, the farmer should have a good, if not wide acquaintance with botany.

If, in connection with his farm, he is running a dairy, he must know how to test milk, otherwise he may be losing money, either because of poor stock or through being defrauded at the creamery. Even with the ordinary amount of livestock, the farmer should have a good working idea of veterinary medicine and surgery, for with this at his command, he may be able to render not only quick but effective service in cases of emergency. Such knowledge is doubly requisite to a stock raiser. It is likewise necessary that he should be able to render "first aid" in case of accident or illness in his family or to his employes. Should he be capable of rendering such service, he might be able to save human as well as animal life, for it might be hours before a physician or surgeon could be gotten.

It matters not how expert a man may be as a farmer, unless he is a business man, he can not make the most out of his farm. Lack of system involves a great loss of time, and unless he can quickly detect leaks and stop them, he will not succeed, and the only way in which this can be accomplished, is through a simple system of bookkeeping. On small farms, it need not be elaborate but it should be sufficiently full and complete to enable him to know whether each branch of the farm has made or lost money during the year. To get the best results of his labors, the farmer must keep in touch with the demands of the markets and the prices prevailing. Having enumerated some of the qualifications that a farmer should have, and I know many who possess them, is there a man among you, who will have the temerity to say, that the modern, scientific, up-to-date progressive American farmer is not the peer of any man. As he is mortal, he has his faults, for no man is perfect. There is a class of farmers, and I have met some of them, that is shiftless, and seemingly without ambition. Their farms are a disgrace, but in every walk of life and in every trade, business or profession, such fellows are to be found.

The introduction and application of labor saving machines and appliances to the work in the fields, to the barns and homes, will largely wipe out the drudgery which has, in the past, too often characterized farm work in all its branches. With the passing of drudgery, the farmer will have more time for study, recreation and mental improvement. Brain will largely take the place of brawn and the farmer will come into his rights and just deserts of which he has so long been deprived. The motor truck will enable the farmer to reach markets now inaccessible to the horse drawn wagon. The automobile will bring him and his family into closer touch with his neighbors. It will also bring many city people to the country on their outings. The city and country people will get to know

each other better and much of the isolation and many of the deprivations you have heretofore experienced will be things of the past. The future of the farmer, to me, seems brighter to-day than ever, if all wasteful methods are wiped out.

In conclusion, let me say to you, your wives, your sons and daughters, "Stay on the farm," for drudgery, through the use of new methods and machines, will be largely abolished and pleasures, that your grandparents never knew, will be yours. In the country is to be found Nature, pure and sweet; there you are closer to your Creator than elsewhere, and in the not far distance future, we expect to see the happiest, healthiest, most contented and prosperous people of the Nation on the American farms.

The CHAIRMAN: You have heard this report—what is your wish in regard to it.

It was then moved, seconded and carried that the report be received and placed on file.

The CHAIRMAN: Our next report is from the Agricultural Geologist, Mr. Stout. (Applause).

MR. STOUT: Mr. Chairman and Members of the State Board, Ladies and Gentlemen: It is always embarrassing to me to stand before such a large audience, and having received already an applause adds to my confusion. I suppose it is not necessary for me to be introduced here as a member from Schuylkill county. I told you several years ago that we prided ourselves and hoped to have better roads in the near future, because of the fact that the Legislature levied a tax of about 10 cents a ton on all the coal that was mined in the anthracite coal district. We expected to use this money to build good roads, but, unfortunately, as it should have been known when the law was passed, it was unconstitutional. If anyone ever read the Constitution of Pennsylvania, Article 9, it will tell them that it was an unconstitutional law, but it took about two and one-half years to decide that fact through the courts, and the Supreme Court to say that it was unconstitutional. Now, each of you people who bought coal and used it up paid 10 cents a ton, and I suppose you never got it back—we didn't anyway. Now, that money is somewhere, and I think you could find it down in the pockets of some of those men who were instrumental in having that law passed.

Now, I feel entirely unable to do justice to this occasion, and it reminds me of a story that I heard some years ago. It was down in Chester county where the people had a custom of hauling things on carts, and I think they do it yet, a great deal of their carting is done with carts, and they hitched horses tandom, one in front of another—sometimes three, four or five in a row. I saw them haul lumber, manure and coal and lime, and all those things around, and one of those Chester county farmers wanted a helper on his farm, and he found out that there was a fellow in Lehigh county, named John, who wanted work, so he got in correspondence with him and hired him. John was one of those Pennsylvania Dutch or Germans, and in some of these sections of Pennsylvania the Germans are rather

rude in their conduct, and usually very profane. Well, he got him down there and he saw he was a good worker and he liked him, and they worked along together; but he found out that once in a while he would overhear John using very profane language and he would admonish him—not very severely—but he told the deacon of the church about it. He said, "John is a good worker and I like to have him here, but he is very profane and I would like if you would take him in hand and admonish him." The deacon said, "Well, I will." So he spoke to John off and on, and on one occasion—this farmer was one of the Society of Friends, and they never say any bad words out loud, you know—so he told him, "Now, you take the cart, load it full of apples, put some bags on too and a couple of empty barrels and go over and have some cider pressed, we want to have some apple butter to-morrow." Well, John did as directed and started off, and on the way to the cider mill he happened to meet the deacon, who was going in the same direction, so they walked side by side, everything was going along nicely and they talked pleasantly, and they went up rather a steep hill, and they had almost reached the top when the jolting of the cart shook out that stick that holds down the box on the cart and they all fell out, and by the time they looked around the cart had dumped off the barrels and they went down the hillside and the apples rolling in every direction, and everything was in confusion. John didn't say anything—he just looked at it, and the deacon said, "John, I am surprised that you can control yourself under these trying circumstances." John scratched his head and said, "I absolutely can't do justice to this occasion." Well, I feel a good deal that way myself.

Mr. Stout's paper is as follows:

REPORT OF AGRICULTURAL GEOLOGIST

By W. H. STOUT.

With more time to review some experiences and theories since the Department allows me a vacation without pay and while waiting to be placed on the pension list, I take this opportunity to mention some things that are of interest, at this time, when so many are in the field to uplift the farmer; discharging adjectives, verbs, conjunctions and interjections from the rostrum through the press and magazines.

Associated with many persons during past years, hearing and reading advice to farmers, in many instances it came from those who claim as having been brought up on a farm, but now engaged in other occupations; having left parental homes when they found that actual work was required from them which did not agree with their psychology. Among the fallacies advanced by scientists, that of Jethro Tull, that tillage supplies the place of manure, that crops can be continuously grown without manure from first to last is one instance. Baron Von Liebigo's theory of soil analysis is no longer

considered of even theoretical value, yet new emphasis given to both theories by recent authors and lecturers, even by the United States Department of Agriculture. The analysis of plants and actual tests by crops are practical methods to determine what the lacking elements in the soil actually are. The use of raw phosphate rock was advocated which has been found of little value after testing it in various experiments, the material being insoluble, possibly useful to the next generation.

Another theory advocated and tried was cultivating wheat in rows, which was found unprofitable. I saw the experiment at Craighead's, out from Carlisle, and abandoned; as about the period when it was tried the price of wheat was only fifty cents per bushel. During recent years a force of experts—so called—are engaged in soil surveys and soil analysis throughout the country joined by some states making chemical and mechanical tests and describing the agricultural value; all of questionable utility unless finding employment for a lot of students and spending a large sum of money is a consideration.

This State contains within its boundaries what are termed three grand divisions in Geology: Silurian, Devonian and Carboniferous. These are divided and sub-divided into numerous formations and as many names. When the soil survey was commenced it was expected to revolutionize agriculture, and, as one interested, paid close attention especially when the adjoining county of Lebanon was reported. Lebanon county is almost entirely in the Silurian system and the agricultural part entirely so; limestone, slate and shale in predomination. The limestone was known as Trenton, Calfariferous ous and Chazy in various sections, and the extensive valley from New York into Tennessee, an example. When the soil survey began on this formation it was started near Hagerstown, Md., and named Hagerstown loam, stony loam, sandy loam, silt loam, clay loam and clay. Parallel with the limestone, is another formation known as Hudson River and Utica shale, also the Cincinnati group. The same ridge where the famous Lehigh county potato section is and extensive peach orchards near Allentown, Reading, Myerstown, Lebanon and the Cumberland valley are located. This is part of the Silurian system same as the limestone; however it is classed as Devonian, of which there is none within miles until north of the Blue Mountain. When such blunders are made by persons who are supposed scientists, it naturally reflects upon the whole work, so a novice or layman loses confidence in the soil survey.

All the new names introduced in classifying soils are hundreds and any person wishing to familiarize himself with terms should begin early, work late and take a college course. General geology long since classified systems, divisions, subdivisions and formations adopted as state and nation wide definition. The soils of Pennsylvania, described in a State bulletin by Prof. Menges, is of more value to agriculture than that by the U. S. Soil Survey. The word "expert" appears so frequently of late in connection with agricultural teaching, and the word as defined by Webster is "taught by use, experience, familiar knowledge, skillful, practice, dexterous," is misapplied. The average investment in farms amounts to $8000 in land.

livestock and buildings; so the farmer's income should be based—as any other business—on cost of production after meeting all necessary expenses and have a fair wage. Until agriculture is so adjusted that farm labor can be paid as much as any other industry, can afford considering the intelligence and experience necessary in modern farming, the problem of keeping the right kind of boys and girls on the farm remains unsolved.

We hear much about intensive farming and greatly increased crop yields as a means to make farming more profitable. It is a well known fact that excessive crops are not profitable as prices are reduced to such a low level that loss instead of profit is the result financially aside from the lessened fertility remaining in the soil. Intensive agriculture is practiced in European and Asiatic countries where much hand labor is employed; where the struggle for existence is acute, labor cheap and the agricultural class little better than serfs. If the American people care to become vegetarians, wear wooden shoes and smocks; sleep on wooden blocks and eat with chop sticks; they can do like the Chinese and Japanese—the type that can live on less than any class of humanity. Differing from other countries where the farms are small, here they are increasing in acreage through the investment in real estate by wealthy people who make fortunes in other industries and in public employ.

Europeans use great quantities of fertilizers, an average much greater than in this country, and have home demand for their products among a dense population—no trouble about cost of distribution. We have depleted our soils to feed Europeans until the virgin fertility has been exhausted and now depend upon the south and west for feeds and for fertilizers anywhere obtainable. If we could produce and sell nothing except butter, lard, milk, eggs, fruit and v getables the preservation of soil would be easily solved, but other things are needed to support life and maintain health and vigor in these strenuous times when labor is speeded up and urged to the limit. In proportion to the labor engaged with the modern machinery in use this country produces more, man for man, than any other nation.

We now have an army of self-constituted guardians of agriculture, of a class such as compose our officials and some newspaper editors most of whom get their inspiration from observation. Such make our laws, execute them and determine the meaning after years of deliberation. Seeing agriculture from parlor and dining car windows, from touring cars and rusticating at Palm Beach, Miama, Bermuda and Cuba in winter; at Long Branch, Moosehead Lake, White Mountains, Wernersville and Adirondacks in summer, between times at the Waldorf, Bellevue Stratford, Metropolitan or Traymore, in club rooms sipping "lemonade," are the ones so enthusiastic in advising farmers and appropriate vast sums of the people's money to mollify the producers and consumers to gain their good will and votes. Of this class some favor an embargo on farm products, encourage Canadian reciprocity and boycott eggs and butter, talk preparedness and occupy the first row of pews, "wearing the livery of heaven to serve the devil in."

It is not intended that the views herein expressed are antagonistic to real science, as it is an admitted fact that experience, invention and science are of incalculable value in all lines of human endeavor.

There is a wide difference between theory and experience. While the two are useful in practice and work well together, experience is of great importance. Within recent years great institutions are endowed to prepare *experts* in agriculture whose experience is limited to class and dining rooms, learning dexterity in handling knives, forks, spoons and hash and finding their way to the pie counter and the till to public funds.

It would appear as if the uplifting movement had about reached the limit. But there is another in process to uplift households on economics by engaging women county agents with fireless cookers, bread pans and ladles to demonstrate how to make mush, egg omelet, roast turkey and how to raise babies, or advocate what. Mrs. Sanger was prohibited from advising in New York.

Three hundred and fifty are thus engaged leaving sixteen hundred vacancies to be filled. And to think in the great Keystone state a single county employed a woman county agent to enlighten the benighted housewives and explain calories, carbo-hydrates, proteins and fats.

It appears that a few autocratic persons are gaining the audience of legislators with a view to control all avenues of agricultural education to gain popularity and the plaudits of a credulous public under the pretense of patriotism and love for the dear people, at the same time petitioning and appealing for appropriations and more appropriations to add to the burden of supporting increasing numbers of economists and uplifters.

Public funds are squandered lavishly upon all sorts of schemes to make room for greedy aspirants for places at the pie counter until it has become necessary to cast about to find new sources of revenue to supply depleted treasuries, national and state; to bond and mortgage the future to meet the extravagancies of this generation. What is left to this country's wealth is contained in the first twenty-four inches of soil, being rapidly exhausted to support the home population and those in foreign countries depending upon the western hemisphere for their daily bread and roast beef.

The latest government report on the value of crops produced in the United States last year amounts to the vast sum of somewhat over nine billion dollars, which, if divided between six million farms, affords each a little above fifteen hundred dollars—about five dollars a day to meet all expenses that are involved in a years operation. It takes the entire income of nearly seven farms to pay one official or the labor of ten men earning one thousand dollars a year to pay a single commissioner to look up the egg trust, beef trust, coal trust, and trust upon trust. This does not include necessary expenses.

State Senator Charles W. Wicks, Chairman of a Committee appointed to investigate agricultural conditions in New York state reports: "Not more than one-third of the farmers of this state are making any profit at all. One-third are not breaking even. The other third are making about fifteen cents per hour for man labor and nothing for farm women." Much of the blame for the high cost of living is charged to the much abused middle-man, very many of whom are honest and reasonable in their charge and necessary in the distribution of agricultural products as much as are the army of commercial agents daily traveling all over the country. Back to

the land is the slogan loudly proclaimed from various quarters and very often those who heed the appeal without experience soon come to grief, and after spending a large sum in *scientific* agriculture and pet theories hang out signs "Farm and Stock for Sale." The abandoned poultry plants, expensive dairy barns, luxurious surroundings and modern conveniences and high ideals rarely produce revenue to meet expenses.

Public expenses go on all the while increasing and frequently unnecessarily as an example the State Legislature recently convened and adjourned for a period during which the expenses continue at the rate of seven hundred dollars a day; forty-nine hundred dollars a week and twenty thousand a month. No doubt some of the committees are busy planning how to promote party politics; how to formulate bills; how to exchange votes to get appropriations for more appointments on commissions, advisors, agents and instructors for favorites at the same time blame the other party for extravagance.

One of the commendable things proposed is the repeal of antiquated, useless laws on the statute books, and it may so happen that the one approved May 8, 1876 creating the State Board of Agriculture may be clandestinely among them. Be on guard!

After many years association with this public spirited, useful and unselfish organization as a member and specialist without perhaps adding to its dignity or usefulness, it is at least a flattering recognition of having done a little to alleviate distress among the poor people.

If the Department carries out the proposed movement to distribute tad poles throughout the State, to produce cheaper meat by supplying an abundance of "bull-frog legs," future generations will respect and honor your humble associate from Schuylkill county as an early advocate of this measure to stock the waters of the State with "Rena Pipiana," so that when workers open their full dinner-pails to find the hind quarters of prepared bull frogs on toast buttered with oleomargarine they will bless the Department and your humble servant.

An embargo should be placed on bull frogs. Having served a just and lawful time in assisting to uplift humanity and outlived this progressive age it may be well for the benefit of the coming generation to find a substitute more capable to continue the good work through the State Board of Agriculture.

THE FARMER'S BURDEN

"Rural uplifters, Commissions, Investigators, Surveyers, Demonstrators, Inspectors, Theorists, Politicians, Promoters, Farmomanics, Agents, Advisers, Economists, Office seekers, Combinations, Trusts, Pseudo scientists, Faddists, Experts, All-around Cranks, Instructors, Kid Glove Agriculturists, Agitators, Tax Consumers, Professors, 12, 10-8-6-4 M dollar Officials, Thistles, Thorns, increasing Taxes, Bugs and beetles, worms and fleas, flies and germs, Bacteria and Moths, Rots and Molds, Blight and Scale, Lice and Mites: Floods and droughts, wind and hail, frosts and fires, hawks and owls, weasles and minks, snakes and lizards, rats and mice, inflictions upon agriculture, besides the high price for coal, lumber, gas, hardware, labor, coffee, sugar, potash, nitrate, rubber, leather, diamonds and pearls, steel and iron, bathtubs and soap, everything 100 to 800% more costly while farm products are 50% advanced except hay."

MR. HUTCHISON: Mr. Chairman, I have an appointment that I have to keep and I am not feeling just the best this morning, and then being connected with the Department of Agriculture, I am going to ask that the Legislative Committee of this House permit Brother McGowan to appoint Dr. Beck in my place to serve on this Committee that is going to pass on this bill. I would ask a unanimous consent of the House that Dr. Beck take my place on that Committee.

It was then moved, seconded and carried that Dr. Beck take Mr. Hutchison's place on the Legislative Committee.

The CHAIRMAN: Is the Executive Committee ready to report?

MR. BLYHOLDER: We are. The Secretary, Dr. Beck, will make the report.

Dr. Beck then read the report of the Executive Committee, which is as follows:

REPORT OF EXECUTIVE COMMITTEE

Your Executive Committee begs to submit the following recommendations for your consideration:

ADVISORY COMMITTEE

John P. Young,.....Marion.
Clark M. Bower,.....Blain.
W. Frank Beck,.....Altoona.

LEGISLATIVE COMMITTEE

H. G. McGowan,.....Geiger's Mills.
R. W. Lohr,.....Boswell, R. D. No. 1
Geo. G. Hutchison,.....Warrior's Mark.
Matthew Rodgers,.....Mexico.
P. S. Fenstermacher,.....Allentown.

COMMITTEE ON RESOLUTIONS

John A. Woodward,.....Howard.
B. Frank Wambold,.....Sellersville.
B. F. Killam,.....Paupack.
W. C. Black,.....Mercer.
J. Aldus Herr,.....Lancaster, R. D.

MEMORIAL COMMITTEE

J. Miles Derr,.....Milton, R. D.
E. A. Studholme,.....Smethport.
S. C. George,.....West Lebanon.

CONSULTING SPECIALISTS

Botanist,	Prof. F. D. Kern,	State College.
Pomologist,	Chester J. Tyson,	Floradale.
Chemist,	Dr. William Frear,	State College.
Vet. Surgeon,	Dr. C. J. Marshall,	Harrisburg.
Sanitarian,	Dr. W. Frank Beck,	Altoona.
Microscopist and Hygienist,	Prof. J. W. Kellogg,	Harrisburg.
Entomologist,	Prof. J. G. Sanders,	Harrisburg.
Ornithologist,	Prof. Boyd P. Rothrock,	Harrisburg.
Meteorologist,	Prof. W. G. Owens,	Lewisburg.
Apiarist,	H. C. Klinger,	Liverpool.
Economic Geologist,	Prof. Baird Halberstadt,	Pottsville.
Agricultural Geologist,	W. H. Stout,	Pinegrove.
Forests and Forestry,	Irvin C. Williams,	Harrisburg.
Feeding Stuffs,	G. G. Hutchison,	Warrior's Mark.
Soils and Crops,	Prof. Franklin Menges,	York.

STANDING COMMITTEES

CEREALS AND CEREAL CROPS

John P. Young,.....Marion.

CONSTRUCTION AND MAINTENANCE OF EARTH ROADS

George F. Barnes, ...Rossville.

FRUIT AND FRUIT CULTURE

A. I. Weidner, ...Arendtsville.

DAIRY AND DAIRY PRODUCTS

Dr. M. E. Conard,.....West Grove.

FERTILIZERS

John H. Schultz,.....Norristown.

WOOL AND TEXTILE FIBERS

W. C. Black,.....Mercer.

LIVESTOCK

James M. Paxton,.....Houston.

POULTRY

W. Theo. Wittman,.....Allentown.

MARKETING

J. Aldus Herr,.....Lancaster, R. D.

(Signed,)

S. S. BLYHOLDER,
M. E. CONARD,
H. G. McGOWAN,
W. FRANK BECK,
JOHN P. YOUNG,
MATTHEW RODGERS,
P. S. FENSTERMACHER,
CLARK M. BOWER,

Executive Committee.

It was then moved, seconded and carried that the report be received and adopted.

The CHAIRMAN: Now, ladies and gentlemen, I am going to take the liberty at this time to change the program just a little. We are honored with one lady member on this Board, and I will take the liberty and pleasure of calling on that member now to speak to us, Mrs. Jean K. Foulk.

Mrs. Foulk spoke as follows:

ADDRESS

By MRS. JEAN KANE FOULK.

I came before this Board three years ago and outlined very briefly what I hoped to develop and make out of my office of Farm Adviser. The office was a new one, not only in title, but in object, for it was the first time that any such work had been undertaken by the State Department of Agriculture, and the first time that rural women's interests and needs in the home and farm life had been given a definite standing or been recognized as so essential a part of the agricultural life of the Commonwealth as to demand a special representative of their demands and needs. To be sure we had had women institute lecturers; I think seven was the greatest number at any one time, and there were seasons when only one was regularly scheduled in the institute bulletin. Therefore, the appointment of a Farm Adviser of Homes was a marked advance and change—even if it did not only mean one woman to help solve the many and complex problems of the rural homes, in the state having the largest rural population in the Union.

I am asked to come before you to-day in order that I might again enlist your interest and sympathy in this work. I want to give you a brief outline of the work done and how it has been done, and I want to suggest to you how it should be continued and developed and the need that it *should* be continued and developed.

Within the last year I have travelled over 23,000 miles. I have never made a visit or delivered an address that has not been asked for, nor, on the other hand, have I ever refused to go, but have always been ready for service. I have written over 2,000 letters, most of these in long-hand, because I had no money to pay for a stenographer. I have paid special visits to, or, had interviews with over 300 individuals, and have made over 165 addresses where all the local expense was covered by the people to whom I went to speak, and where the audiences ranged from a handful of interested women to mixed audiences of several hundred persons. I have written many articles for publication. I have been called upon to design improvements in homes in connection with these visits and lectures, and have started, or helped to start, community centres, home-school associations, girls' clubs and mothers' clubs in many counties of the State. When

travelling in rural localities I make a practice to visit rural schools and speak to the children and teachers. I have been instrumental in the installment of a number of septic tank sewage systems. In one township in Erie county there are four rural schools which now have this improved system.

This list of activities does not cover the interviews I have had with women who are working in various ways that stand for extension work, who wanted advice and sympathy and help of various kinds that I could give them from my experience. Nor does it cover such items as advice given to women on farms who own the farms and are trying to manage them themselves. It would be impossible to tell the details that all this work has covered, for there is hardly an item of interest connected with the rural woman's life that I have not come in contact with. To simplify and extend our influence we should have bulletins and leaflets and printed information in various forms that could be sent over the state to answer inquiries, so as to relieve the pressure of so much writing and the expense of travel that personal interviews entail. A stenographer could easily be kept busy by this branch of the Department. To get data and put it together for bulletins and leaflets takes a great deal of time. One person cannot make addresses on so many diverse interests, or understand and answer the hundreds of questions that come to one, without time for study and thought. Many times the work has been curtailed, because of the lack of funds, and I have not been allowed to work continuously, but have been laid off for weeks at a time, because the money for my expenses and salary was not forthcoming. The demand for other farm advisers has been very great, I know, but when it comes to a question of cattle, soil and poultry vs. the home, the fact that the legislature appointed eight men and one woman on this Board, will show how the appropriation has been divided. The women of the State, the Federated Club Women, the Rural Women, the Grangers, the Suffragists, and even the Antis, all feel that we need and should have more done for our homes, and that this appointment of a farm adviser should be but the entering wedge for more and better things. Three years ago, when I was not only the baby member of this Board, but, as I am to-day the only woman member of it, I made a plea for your support and asked you for help. I asked them in general terms —now, I am asking for a definite thing. I want money appropriated for this special branch of the work, that more people may be employed, and what is done, may be better done and in a more organized way. The work shows there is a demand for it not only in farm homes, but in homes everywhere, urban and rural. Then, won't you, one and all, use your influence to help bring this matter properly before the legislature so that the interests of our rural women and children—yes, and of the men as well—may not be neglected, but that their interests may be substantially advanced and their living conditions improved during years that are to come?

The CHAIRMAN: We will next hear the Report of the Committee on Livestock, Mr. Doris L. Fulkman.

Mr. Fulkman's report is as follows:

REPORT OF COMMITTEE ON LIVESTOCK

By DORIS L. FULKMAN, *Chairman.*

Livestock farming of our State has not advanced so rapidly as some other lines of farming. Compare our way of harvesting half a century ago and now and you can quickly see the difference. You may ask me why it has not. Here is an example of what is going on on too many of our Pennsylvania farms. A Mercer county farmer had a Holstein Jersey heifer which he bred to a Guernsey bull because he thought it would make a good conglomeration. We have too many farmers who don't care what to drink so they take the whole blamed business. A man in the livestock business should have a goal, the goal should be a Percheron, a Belgian, a Holstein, a Guernsey, a Jersey, a Berkshire, a Chester White, a Merino, a Southdown, or some particular breed of livestock in which he is interested. If you were going out to buy a good draft horse you would go where they had been raising the breed of your liking for years the same of any other livestock.

The question then arises of community breeding. Does it pay for a community to raise the same breed of livestock of the different kinds? Yes. It is community breeding that makes Waukesha advertise as the Guernsey capitol of America and Jefferson county, Wisconsin as the Holstein and Guernsey hub of the world. Take any county of our State and find a community where a certain breed of livestock has been raised for a generation and you will find better homes, better schools, better roads, better crops growing on the land and a higher ideal of morals than where they have no particular aim in raising livestock.

I know of one community that keep Jersey cows and patronize a community creamery that is known for miles around on account of its prosperity, when hay and grain dealers want to buy a few cars of hay or wheat that community is gone to first because they can supply their wants at less expense. Attend their church and you will find a people who look prosperous and happy, pay their preacher before the annual meeting and give over $1,000 per annum to missions. Go into their community on certain Tuesday evenings they will take you to their large buff brick Grange Hall, show you every nook and corner of it and finish by telling you it is paid for. A certain farmer in this community went down to Kentucky to a Jersey sale and paid $1,000 for a bull. Now every farmer cannot do this but every community can. The best sires are not too good for any community provided they appreciate their value.

All good livestock is by no means pure bred; but that is no argument why we should keep grades. If a man is successful with grade livestock that is the best sign possible that he can make a success of the pure bred livestock business. In starting into the pure bred livestock business it is not advisable to sell all your grades at once and replace them with pure breds but buy a sire and one or two females of the desired breed and stick to your breed. A great many failures have been made by changing breeds too often. A jumping jack is a good thing to amuse people with but they usually die in the act.

A Lawrence county farmer at a pure bred Percheron sale in October, 1914, bought an imported mare for $400. The next spring she dropped a horse colt for which he was offered $100 when it was six months old but would not accept. Was not this a good investment when the mare made a half team and dropped a mare colt in the spring of 1916? The grand champion steer at the International Stock Show at Chicago was not a pure bred but was a pure bred Hereford Shorthorn cross which may bring results for one cross but after that you go down instead of up the ladder.

Now, before leaving the subject of pure bred livestock, I will say that we should not buy it for the papers alone, but should buy animals that have the qualities desired. Livestock farming is the only branch of farming that will not only support itself but will leave the land in a better state of fertility than it was before. In 1916 the seven leading Western markets received 9,320,050 cattle which is 1,536,468 more than they got in 1915 and 2,146,810 more than in 1914. These figures do not indicate what the nations' herd of cattle has grown during the past two years. No doubt there has been some increase on farms and ranches but they are marketed lighter than heretofore. During the past year the seven markets have received 25,343,895 hogs against 21,631,482 in 1915 and 18,261,541 in 1914. The marketing of sheep and lambs has been slightly in excess of 1915. In 1916—11,637,108 reached the market which was 476,879 more than in 1915 but 1,634,344 less than in 1914.

In spite of the light weight of cattle and hogs there has been an increase in the supply of meats, the prices of meats are the highest known, partly on account of our export trade, another the biggest home consumption in time of high cost.

A number of Lawrence county farmers make sausage and sell it to the grocers of New Castle at 18 cents per pound. Last week they raised it to 20 cents and there was very little opposition. Last year they sold it at 15 cents and had they made a raise of two cents the grocers would not have bought it because their patrons would not have stood the raise, but this year money is plentiful and pork somewhat scarce so they buy. The farmer talks about not getting enough for his products. Was there ever a time before when he could get from 13 to 18 cents for dressed pork or $2.50 for a bushel of potatoes. Farm products are high and the time to make hay is while the sun is shining for it is not going to always shine so brightly as it is now shining.

I have mentioned a few of the animals that we want to keep on the farm but there are two others that will have to be kept if we are to exist and be a prosperous nation, the boy and the girl. Give the girl a chance to do something besides washing dishes and such jobs which they seldom like, let them help with the cooking and baking for there is as much art in baking a loaf of bread that is fit to eat as there is in playing ragtime music and powdering and painting. Give the boy an interest in some of the stock or crops and when it is sold let him have his share of what they bring. Teach him to think along farm lines, teach him that farming is just as honorable as any other vocation so that when he is old he will not depart from it.

In conclusion, I wish to repeat the Country Boys Creed, by Edwin Osgood Grover.

"I believe that the country which God made is more beautiful than the city which man made, that life out of doors and in touch with the earth is the natural life of man. I believe that work is work wherever we find it but that work with nature is more inspiring than work with the most intricate machinery.

"I believe that the dignity of labor depends not on what you do, but upon how you do it, that opportunity comes to the boy on the farm as often as to the boy in the city, that life is larger and freer and happier on the farm than in town; that my success depends not upon my location but upon myself, not upon my dreams but upon what I actually do; not upon luck, but upon pluck.

"I believe in working when I work and playing when I play and in giving and demanding a square deal in every act of life."

It was then moved, seconded and carried that the report be received and spread on the minutes.

The CHAIRMAN: The next report is on Poultry, by W. Theo. Wittman. Is Mr. Wittman present? Well, perhaps, there is some discussion on the last report just read. Is there any discussion on this last report—the report on livestock?

MR. BLACK: I recall that two years ago the writer of the report made this statement—that the farmers of Pennsylvania must raise more beef producing animals or the people would soon become vegetarians. But Governor Brumbaugh told us yesterday about the Dutchmen eating cabbage at $110 a ton wholesale—now the question is, what will we eat?

The CHAIRMAN: Is there any further discussion? I was informed a few minutes ago that Mr. Klinger was not present when his name was called, but is present now. If Mr. Klinger is present he will please come forward and give us his report.

Mr. Klinger's report is as follows:

REPORT OF THE APIARIST

By H. C. KLINGER.

It becomes my duty to prepare and submit the following as my Eighth Annual Report as Apiarist to the State Board of Agriculture. There is nothing new or startling to report for the year just past, in the line of Apiculture. Reports coming in during the earlier part of the season indicated a large crop of honey; but drought setting in throughout different parts of the country greatly reduced expected production. According to verified reports, the yield of honey is shown to be 28% greater in 1916 than in 1915. That for Pennsylvania is 54 pounds surplus per colony or 37% greater this year than the preceding year. All the states have shown an increase in production over that of 1915 with the exception of four of the Atlantic states, North Dakota and seven of the extreme Western states.

In the matter of honey consumption, over 67% of it is used locally and does not find its way to outside markets. The demand for honey is rapidly increasing and better prices are being obtained. There are several factors responsible for this: The increased cost of all food products; a system of extensive advertising; the shipment to the countries at war of the cheaper grades of honey to take the place of sugar, and lastly, honey is being recognized as a food, not a luxury —a food that helps to make up a balanced ration for the human body. The nations at war have discovered that honey has a greater food value in units of energy than many of the other staple articles of food.

Dr. Hirshberg, of John Hopkins University, says, "Honey has weight for weight, and bulk for bulk, more nourishment, more fuel and more heat units than meat, fish or eggs. One ounce of honey surpasses an egg by 75 units. Moreover it is decidedly cheaper and twice as helpful to human energy."

A table of comparisons was recently compiled by the Iowa Food and Dairy Department showing the following:

Honey at 20c a pound, or 7 oz. at $8\frac{3}{4}$c equals

5.6 oz. cream cheese worth,	$10\frac{1}{2}$c
10 eggs,	10c
12 oz. beefsteak,	18c
15 oz. codfish,	20c
8 oranges,	24c
5 bananas,	10c
8 walnuts,	13c

The slogan today in bee-keeping is "Eat Honey." It is not a luxury, it is a valuable article of food and cheaper in comparison than many of the commonly used food products.

The business of honey production is rapidly assuming its place among the agricultural activities of the State. There are perhaps no greater number of bee-keepers than formerly, but they are becoming more wide-awake. This is due to the fact that the scourge of bee diseases which is sweeping over the State is putting bee-keepers on their mettle and is also to some extent eliminating the careless, slip-shod box-hive bee-keeper whose method of bee-keeping has been a nuisance to his more progressive neighbors.

The status of the bee-keeping industry a dozen years ago was different from what it is today. Then no agricultural school had given the slightest recognition to apiculture. Today Agricultural Colleges in ten states offer courses in bee-keeping. Then the National Government did very little for the Apiarist and his industry.

Congress has now appropriated $25,000 for Apiculture—$5,000 of which is to be used for inaugurating extension and demonstrative work. Government experts are now working in three different states, encouraging and teaching modern methods and appliances. Many of the states have inspection laws. Others are repealing inadequate laws and passing better ones. Greater efficiency is demanded of the inspection force and the entire work of inspection is being put on a firmer basis. Some of the states where several years ago foul brood diseases were rampant and bee-keeping became almost impossible, now report the diseases under control and the industry vastly improved, and the production of honey largely increased.

Localities in our own State, where inspection work was carried on, report an absolute cleaning up of the diseases. Under former conditions it was impossible to secure any honey, now large crops are again obtained showing large returns for the small expense incurred by inspection work. Campaigns of education are being conducted in different ways teaching the public the value of honey as a food and also the value of the bee to the fruit grower as a pollenizer of fruit bloom. Thousands of families who never thought of honey are now substituting it for sugar, realizing it to be more healthful and less expensive. This has caused the demand for honey to exceed the production out of all proportions insomuch that in many places the market for extracted honey was all cleaned up before the holidays In speaking with the proprietor of one of the large honey farms of Sioux City, Iowa, recently, the subject of conversation turned on the possible over production of honey. His reply was that while they were using tons of the article their only trouble was in meeting the increasing demand for it.

Some one threw up his hands in dismay and said to one of our State inspectors, "What are we going to do with all the honey when all these farmer bee-keepers are educated to modern methods of bee-keeping?" It is safely estimated that only one per cent of the population of the country now eat honey, and if all the honey now produced were passed around it would barely give each individual a taste of it.

The Pomologist may perhaps safely caution farmers to go slow in planting commercial orchards for fear of over production, even when choice apples now bring 60 cents a dozen. The Apiarist on the other hand believes that every farmer having an orchard should set a few hives of bees in it by doing which he would not only secure finer fruit but also get a good share of Nature's sweet without causing a slump in the honey market.

ECONOMY—EFFICIENCY—PREPAREDNESS.

We have thus far avoided the use of these words because their frequent use has made them thread-bare. But lest some one might criticise this report on account of their absence, we have placed them all together to percolate through the remainder of the report as your thoughts may suggest.

Comparing the present state of the bee-keeping industry with its future possibilities, it seems yet to be in its infancy. Pennsylvania has a variety of honey bearing flora unexcelled by that of any other State. Early in the spring as soon as the weather is warm enough for bees to fly until the heavy frosts of Autumn come there are flowers of some kind blooming that secrete honey. The soft maples and willows open early in spring and their honey stimulates early brood rearing. This is soon followed by the various fruit blooms which frequently give a start in the surplus department. This is shortly followed by the locust which for a short time yields profusely. After this comes white and alsike clover. The blossoming period of the former extends through a period of several weeks. The heaviest flow of white clover is in the month of June; but quite frequently it tides over until the buckwheat season comes. In some sections where

the timber has not been taken off too closely, basswood and poplar give large yields. Sumac during the early part of July never fails to give a crop and the honey is of a fairly good flavor. Next comes buckwheat which begins in the middle of July and lasts until late in the season. This in many parts of the State is the main crop. Lastly comes golden-rod and the asters which continue to yield even after the first frosts. In this large list of flowers there has not been known a year when they all failed. Many states depend upon a single flower for a crop and if this fails in producing their entire crop is gone.

It is estimated that there are nearly 40,000 bee-keepers in the State, with an investment of over $2,000,000 and an annual product of over $1,500,000. It might appear from these figures that it would not be safe to encourage any further investment, yet from practical observation it is known there are miles and miles of territory that do not have a single colony of bees, and that have an abundance of flowers that produce honey. It is estimated by one of our inspectors that ten colonies of bees could be kept where one is kept now without overcrowding. It has been demonstrated that within the radius of a few miles a ton or more of honey can be gathered and from this fact it must be evident that tons upon tons of honey are going to waste every year. Where is the economy in all this?

Every up-to-date bee-keeper knows that by the proper attention and management of his bees each colony can be made to store double and sometimes more than double the amount they often do. Also by the sowing of leguminous plants such as the alsike, crimson and sweet clovers and vetches any territory can be made to support more bees aside from increasing soil fertility so much needed. This is efficiency.

And here is the end—the part usually containing the sting. The Apiculturist is not without his troubles. The diseases of American and European Foul Brood are making a disastrous sweep over the entire State. It has wiped out whole apiaries in different parts of the State. It is as contagious to the bees as small-pox is in the human family. A single bee carrying honey from a diseased colony may in a short time infect a whole apiary and cause the loss of every colony besides spreading the disease to neighboring yards.

Excellent results have been obtained by the work of inspection done in the past few years since we have an inspection law. Thousands of colonies have been inspected and whole communities helped and cleaned up. The work is a credit to our State, and to those who did it, but inadequate funds do not permit the keeping of a sufficient force of inspectors or a system of fighting by which the diseases can be stamped out. It is similar to fighting fire; unless there is a force sufficiently strong enough to hold it in bounds it will compel a retrenching on ground already covered. It will require a vigorous system of work by which it can be driven from township to township and from county to county and the ground once covered made immune to recurrent attacks.

This work will depend entirely upon legislative action. If the means are adequate there is no reason why this State should not be made the first in the value of honey products. With a campaign of education and a thorough system of inspection work this industry can be made one in which our State may well be proud.

The CHAIRMAN: Have you any discussion on this subject?

MR. KILLAM: Mr. President, I would like to ask the gentleman a question. I am very much interested in your report, although I am not a bee-keeper. In our country we have what we call wild bees. We have a large forest there, and the bee hunters ever hardly find a tree in an unhealthy condition; they tell me they generally find them filled with honey. Now, I wonder if the enemy that destroys bees ever gets into the forest where our wild bees are.

MR. KLINGER: Has the foul brood struck your county, that you know?

MR. KILLAM: I don't know. There are very few bee-keepers there, but we have people who make it quite a business to find honey in trees in an immense forest where the timber has been taken out and the hardwood taken out and a good many trees are hollowed, and that makes a good home for the bees.

MR. KLINGER: The foul brood may not have struck that section of the State, but it's undoubtedly true that if those bees were to get a drop of honey that contains germs of that disease they will certainly get it. It doesn't take long when the disease strikes the wild bees, that is, the bees in trees, before they are cleaned out, but when it strikes a bee-keeper who is careless, he may have it in his yard and drag it over that section and he may have it for a year or two years, and may infect from one place to another. They think that in the woods it is sooner cleaned out among the bees in the trees, as it is thought they are more vigorous than bees in colonies, but I don't think they are. Now, speaking for Juniata county and some of my neighboring counties, the disease didn't strike us until a few weeks ago, and then it simply swept through there and cleaned up everything. Many who have 25, 30 or 40 colonies report their colonies in a rotten condition.

DR. CONARD: They say it's an ill wind that blows nobody good—and I want to ask you a question—whether the introduction of the foul brood might be used to drive bees away when they are objectionable. The case I refer to is this: One of my neighbors lives in a brick house with a cornice, extending probably two feet, and the bees have taken up their abode in those cornices and they can't get them out, and it's under a slate roof, and the honey melts and runs down the side of the house. They can't get any benefit from them at all and they have become a nuisance there, and they have also swarmed and taken possession of the other end of the same house in the same manner. Now, it just occurred to me while you were talking whether we couldn't introduce the foul brood there and kill that lot of bees—that's rather a mean thing to do, I know; but they want to get them out of there.

MR. STOUT: Open it up and take them out.

DR. CONARD: Yes, but we are not all like you are; we don't know how.

MR. KLINGER: Can't you invent a way by which you can reach the centre of the surface and just put a spicket there and tap the honey out? There is a way to get them out of buildings and out of trees where you can't open them up. There is a method by which they can do it, perhaps, Brother Stout can tell you.

MR. STOUT: I would open them up and take them out and burn them.

MR. KLINGER: It might take me, perhaps, five or ten minutes to tell you, but it is possible to take bees and honey, but you can't take the comb—you can take bees and honey out of a house and tree—if you can get to the place where their opening is it is possible to get it all out, honey and everything, only combs—you can't get them out, and that is by trapping the bees in their flight and putting comb in another place outside and preventing them from going back there until you have a sufficient large force and then they will inhabit the hive you have on the outside. After you have that done get cream and insert in that colony, and when all the old bees are out and when you are ready, that is, your colony sufficiently strong enough, open up the house or the crack where they go in or the tree and allow that bee to go in there and rob that honey all out on the outside, and there is nothing remaining there except a few larva and the old colony —you have bees, honey and all on the outside.

The CHAIRMAN: Are there any further questions?

A Member: Mr. Chairman, I would like to ask the gentleman if there is any remedy for this foul brood.

MR. KLINGER: Yes, there's a remedy for the foul brood about the same as it is for smallpox. The remedy that they apply is the shaking system. You simply have to get rid of all the honey that's in the hive that may contain a germ, because if there is any that contains germs it may be carried back again. The system used is shaking them out on starters in another hive, so that the honey that the bees may carry along with them—of course, they will when you start shaking—when the bee is disturbed they will think they are being robbed. Put them on starters in another hive, frames with a few inches of foundation, and they will consume that honey in building comb on those starters. Now, some parties claim that one shake will do and other parties claim that to make it effective and to be sure shaking a few days after that again, so that no possible chance of taking any honey from the hive they have into the other hive. You simply have to give them clean, new quarters.

A Member: Mr. Chairman, I would say in case of an outbreak of that kind it would be just as well to take heroic measures and burn them at once and be done with it. If you go monkeying around you'll spread them through the neighborhood, and I think the best thing to do is to destroy them. If the colony is a strong colony it may be saved, but if you are not sure about it the best thing to do is to make a brush fire, as Brother Stout suggests, make a brush fire

if the colony is bad, or a good log fire, and set the colony, the hive, combs, honey, everything, right on there and burn it up, and then cover up the ashes so there isn't a chance for any other bee to get to it.

The CHAIRMAN: Are there any further questions? If there is no further questions the Board will stand adjourned until 1:30 o'clock this afternoon.

Wednesday Afternoon, January 24, 1917, 1:30.

Mr. Louis Piollet in the Chair.

The CHAIRMAN: Please come to order now and we will begin the session for this afternoon. I was not aware that the new vice-presidents were to take charge of this meeting. I supposed that the old board would hang over. They didn't say anything about it this forenoon, but I was told this afternoon we had to get into harness. I thank you, gentlemen, very much for the honor conferred upon me in electing me a vice-president, and I will endeavor to do the best I can to further our interests as the State Board of Agriculture. I believe we are of importance—more so than we think—and if we don't think we are going to do something we won't, so we have got to work together and boost up our cause of agriculture and do our part.

I believe Brother Dorsett wishes to make an announcement.

MR. DORSETT: The announcement I want to make is this: Many of you are members of the Grange and I suppose that most of you will want to take out some insurance, either to protect yourself or your employees, and the Grange is now organizing an insurance company, and they have a notary to take your name. I understand he is at the Board of Trade this afternoon, and any of you who would like to join this new company simply go there and leave your name and it won't cost you anything, and then when the company is finally organized you take out your insurance through this new company. I believe the name is to be The Grange Mutual Casualty Company, and they will issue a policy that is called an In and Out Policy—if you can understand what that means. As I understand it, it means simply this—that whether you come under the new Compensation Act or not this policy will cover you or cover your employees. It's really a double policy. Now, it won't cost you anything to go and leave your name over at the Board of Trade any time this afternoon, and I think the notary will be at the Bolton after four o'clock.

A Member: Is that only for Grange members?

MR. DORSETT: Just Grange members. I suppose that will be extended one of these days, but at the present time that is all they are taking in.

MR. KILLAM: Mr. Chairman, one report was omitted this forenoon—the one on Poultry by W. Theo. Wittman.

The CHAIRMAN: Is Mr. Wittman present? Mr. Wittman, if you will come forward and give your report we are ready to listen to it.

Mr. Wittman's report is as follows:

REPORT OF COMMITTEE ON POULTRY

By W. THEO. WITTMAN, *Chairman.*

As Chairman of your Committee on Poultry, I would respectfully report that several matters noted in the report of a year ago are still trending in that direction, and have even been accentuated. For instance, both eggs and poultry have been higher in price and are likely to go still higher. Pennsylvania farmers have reached 48c to 56c a dozen. Pennsylvania egg farmers, 72c to 87c a dozen and have, besides, been honored this year by New York Produce with top quotation under this phrase, "Pennsylvania and near-by white eggs fine to fancy." The premium paid on choice eggs by this same market this year has been higher than ever. For instance, the quotations November 19th, 1916 were "Fresh gathered, extra fine at 47 and 48c." "First, 44 and 46c, "Fine to fancy brown, 50 to 57c; white eggs 65 to 72c."

These quotations show and I would especially call the attention of this Board to these figures, that best white shelled eggs on this date were bringing the producer 24c a dozen more than best farm eggs and 28c a dozen more than the run of average farm eggs. Also, that white shelled eggs at the same time were bringing 15c a dozen more than selected, fancy brown shelled eggs. Surely with such inducements it is up to our farmers to produce what the market wants and is going to pay for.

This last year, too, eggs started to be higher in price earlier than ever before. Our egg farmers were getting already in August eight cents a dozen more than in August a year ago; were already getting 50c a dozen and better this year in September. Contrary to the experience in other farm crops the poultry farmer as a poultry farmer has had no cause to complain of the prices he has been getting; or the returns made to him for his eggs by the commission men. The just farmer on the other hand has usually not got what is coming to him. He got the price of the poorest ungraded eggs reaching the market or, the price a huckster or collector seen fit to allow him. He especially fell short if his weekly basket of eggs was made up entirely or in part of choice white shelled eggs or even good brown shelled eggs. Such eggs are all graded out— or perhaps graded up would be a better way of putting it—and finally make someone a big profit. The remedy is obvious: keep hens only that will lay white shelled or good brown shelled eggs and consign these eggs to some reliable New York City commission man.

When it comes to the returns for live and dressed poultry these too have seen a big jump, in some cases 50%. Or, farmers who in August, 1915, were getting 12c a pound for old hens got 18c a pound

in August this year. Broilers and squab broilers also brought an especial good price this year. Some growers reported receiving up to 90c a pound. Turkeys brought the producer more and cost the consumer more than ever before. The former received something like 28c a pound live weight and 35c a pound dressed, and the latter paid something like 35c a pound live weight and 50c a pound dressed.

Because turkeys have practically disappeared from Pennsylvania as a dependable market crop and because the great bulk of turkeys sold in this year's holiday markets were shipped in, there was a very wide range of prices this year. In one city the day before Christmas there was a glut and turkeys could be had for 28c a pound and not a hundred miles away in another city there was a scarcity and the price jumped to 50c a pound.

The "egg boycott" by city women and so much featured by the big city dailies was an exceedingly unfair and uncalled for movement and was justly, bitterly resented by everyone who had eggs to sell last month. This and the still continued hammering at cold storage eggs and cold storage of eggs can result in only one thing, viz: This same city boycotter is going to pay more than ever next year for eggs. This whether the war ends or not for the blunt truth is, the production of poultry and eggs is not keeping up with the consumption. The city and village backlot poultry grower has quit by the thousands being too busy with both work and play and claiming grain is too high; the farmer is not increasing the size of his flocks and although yearly we have more and more big utility poultry farms these are not filling the ever widening gap as indicated above. Therefore, the prospects of the exclusive poultry farmer that is in or the one thinking of going in are brighter today than ever.

It was then moved, seconded and carried that the report be accepted and placed on file.

The CHAIRMAN: I notice in this program that after each of these papers there is to be a discussion and a chance for discussion and questions. I thought maybe there might be something you would like to ask about. Many of you here, no doubt, are interested in the poultry business and would like to say something.

MR. KILLAM: There is a report from Dr. Samuel Dixon here somewhere. I think it must lay on the table. Now, I think it is well to have that report read and for the Board to make some discussion of the report, and maybe if it is not read they will take it and put it on file. I think it ought to be read.

DR. CONARD: The report was here and I thought probably while I was absent it was passed.

MR. KILLAM: The report was not passed.

It was then moved, seconded and carried that the report of Dr. Dixon be received and filed.

A Member: I would like to ask the speaker on poultry what he considers is the cause that some years certain breeds of fowls, for instance, the Leghorns, will do very good and maybe the next year they will not do so very well—the country over.

The CHAIRMAN: Mr. Wittman, did you hear the question?

MR. WITTMAN: As I understand the question, the gentleman wants to know why it is that Leghorns will do well some years and other years not so well. Well, because the Leghorn is an impatient bird, I might say, under too severe weather conditions. That is, they will do what I call "pouting" in the cold weather. If you want me to tell you the plain, blunt truth, the Leghorn belongs to a warm country and we can't expect the Leghorn to be a good winter layer in the sort of weather we have been having for the last four or six weeks, and especially if not given Leghorn care, as we call it— that is, the pampering care that the Leghorn must have to do well. But when the weather conditions have been like they are during the last four or six weeks Leghorns will not do well. I think that answers the question why Leghorns do better in a mild, open winter than when the weather is very severe. They are very nervous birds too, and like to get out and when they are shut up all winter and can't get out at all, it makes them nervous, restless; and if they do get out it will hurt them a great deal more in the cold weather than it does the Plymouth Rock and other birds.

A Member: Do you think poultry in severe weather should be kept shut up tight or should they have a run?

MR. WITTMAN: Some say they shouldn't get out at all. The practice on the egg farms is almost universal—they believe in keeping them in all the time and not letting them out even on pleasant days but sticking to the idea of keeping them in all winter. Then when spring comes let them out and you can then continue to let them out. Of course, when you first begin to let them out there is going to be a drop in eggs for a little while but you can get more eggs if you keep them in all winter.

The CHAIRMAN: Are there any other questions that you would like to ask about poultry? The next in order on the program is the report of the Executive Committee for this forenoon. I took up the point where Mr. Wittman was to come in, and I suppose the last on this forenoon's program was the report of the Executive Committee. Did they report?

MR. SHOENER: Yes, they did.

The CHAIRMAN: The next for this afternoon is the Report of the Advisory Committee. Mr. Joel A. Herr is the Chairman, I believe, but he is not present and who did you say was the next member?

DR. CONARD: Mr. Killam.

The CHAIRMAN: Mr. Killam will you make the report?

MR. KILLAM: Mr. Joel A. Herr is Chairman of that Committee and he is not here. This is the first time I have ever been called on to take any action on that Committee, and there is no report as far as I am concerned. We haven't been called together by the Chairman, Mr. Herr. Perhaps he is not present.

The CHAIRMAN: No, he is confined to his bed.

MR. KILLAM: Well, there is no report on any Advisory Committee work that I know of. E. E. Tower and myself are the only members on it. We have not been called upon to do any work along the line of a report or investigation or anything else, consequently there is no report of the Advisory Committee.

The CHAIRMAN: Well, as there is no report we will pass that. The next is the Report on Soils and Crops, by Prof. Franklin Menges. I guess Professor is ready for you.

Prof. Menges' report is as follows:

REPORT ON SOILS AND CROPS

By PROF. FRANKLIN MENGES.

In the soil investigations throughout the State during the past year many conditions were discovered which are not so easily explained, for instance, in the Red Shale soils of the southeastern part of the State frequently the surface soil is quite sour while the subsoil is neutral or slightly sweet. The soils and subsoils derived from the Micaceous strata throughout this same area, after years of croping without liming are still sweet or at least neutral.

The surface soils derived from the Bloomsburg Red Shale in Columbia, Montour and Union counties, if at all sour, are only slightly so while the subsoils are invariably sweet or neutral. The soils and subsoils in Montour and Union counties derived from the Helderberg limestone and its accompanying strata are invariably sweet, while those derived from the Marcellus are just as invariably sour and usually extremely so. The soils and subsoils derived from the Mauch Chunk Red Shale in the Conyngham Valley, Luzerne county, are usually neutral or sweet except those of the valleys in which the limy minerals of these strata have been dissolved out, which here causes a slight sourness.

The one plausible explanation that can be offered for the existence of a sour surface and a sweet subsoil in the Red Shale soils of the southeastern area, is that during the heavy liming period as high as 100-300 bushels of lime were applied on these soils at a time and that by this time this lime has worked down into the subsoil and is

keeping this soil sweet all of which is manifested by the fact that red clover will remain two seasons in these soils and yield a splendid crop of clover hay the second year while in the soils which have not been so limed the clover will remain only one year and then make only an indifferent yield. The Micaceous soils of the southeastern area contain a larger number and quantity of basic elements than any soils of any other formation in the State and these elements neutralize acidity as well as lime and sweetness in these soils is not a definite indication that lime is not needed in fact lime applied on these soils, except the shaly hydro micas, has produced splendid results, not because it sweetened the soil but because it supplied this element or liberated elements which the plants needed. The sweetness or neutrality of the soils derived from the limy strata of the Hudson River, the Clinton Red and the Bloomsburg Red Shale, the Helderberg limestone and its accompanying strata and the Mauch Chunk in the Conyngham Valley, when well cultivated, are neutral because the lime contained in these strata is made available or is acted on by the gases brought into it from the air by cultivation, and those formed in the soil by the action of bacteria in decomposing organic matter. But what is still more phenominal is that the soils derived from the strata preiously enumerated will produce luxuriant crops of clover when they are definitely sour, as was demonstrated during the last season by an investigation in Fulton county where in a field with soils derived from the Helderberg limestone and its accompanying strata, Red and alsike clovers and alfalfa were growing thirty-six inches high in a soil definitely sour while the soil of the same origin on an adjoining cultivated field were neutral, similarly on a field in Somerset county with soils derived from the limy strata close to the Pittsburgh coal vein, which were sour, produced a yield of wheat, a lime loving plant of 45 bushels to the acre of a hard red high milling quality, a rather unorthodox agricultural thing for a field to do.

The production of two to three tons of clover hay which it is frequently said will not grow on sour soils and 45 bushels of wheat, a limeloving plant all produced on sour soils, are some of the problems which confront the soil examiner and which he is expected to unravel for the farmer and which it is his duty to unravel. Both the soils which produced the large yields of clover hay and wheat contained some lime and large quantities of organic matter, which in the clover field was derived from applying rich manure and from previous crops plowed under, while that of the wheat field was derived from plowing down a heavy clover and timothy sod amounting to fully three tons of dry matter per acre. Through the intensive cultivation of these soils previous to seeding both these crops, air was introduced into them and healthy processes of decomposition started. After decay had proceeded far enough the ammonifying bacteria took up the process of changng the nitrogen contained in the organic matter into ammonia when this had been attained and in the presence of the ammonia a congenial soil environment produced for the nitrifying bacteria to change the nitrogen into nitrous acid; this operation began and in this way, enough available nitrogen, together with that furnished through the agency of the vigorous

nitrogen gathering bacteria found in the nodular excrescence on the roots of these clovers was provided. Not only was a sufficient amount of nitrogen provided through both agencies previously referred to but the nitrous acid produced in the presence of the limy minerals of these soils combined with the lime and produced the *nitrite* of lime which was readily oxidised and converted into the nitrate of lime, a salt in which both the lime and the nitrogen are in a most available condition and one which both the clover, the timothy and the wheat plant love.

Nitrous acid makes other mineral fertility available especially phosphoric acid. From this it is evident that in order to maintain the productive capacity of the soils it is absolutely essential that whenever a growing crop is in the ground the manufacturing of nitrous acid should be started in such a way that it can continue throughout the entire growing season of the plant, so as to obtain maximum yields. The nitrogen in the soils is well nigh entirely contained in organic compounds and these are usually in such a combination that plants can not obtain the nitrogen and therefore it is necessary that the making available of nitrogen should be maintained and in order to maintain it, there should be at all times more plant residue or organic matter in the soil to furnish the cereal crops with all the nitrogen needed by a maximum yield as well as make available all the lime phosphoric acid and potash these maximum crops may need. That such a condition accidently prevailed in the soils which produced the large yields of clover hay and wheat we do not hesitate to assert and that lime either occurring naturally in the soil or that which had been previously applied and the phosphoric acid and the organic matter were the fertility factors in the production of these crops. With these elements present in these soils and the conditions as previously stated existing, the soil becomes a fertilizer factory with a solvent not harmful but in which all the elements are factors in plant production. This work has been started in connection with the farm demonstration work of the Department of Agriculture by so arranging rotations that a soil improving crop can be raised with every soil exhausting crop so as to have a sufficient quantity of a high type of organic matter present at all times in the soil to keep bacterial life active as well as provide it with the food upon which it thrives and furnishes the plant with the necessary fertility.

A practical experimental demonstration to thoroughly prove and work out the farm without in any way interfering with the regular farm crops has been started at New Kingston, Cumberland county and near Goldsboro, York county. Sweet clover was sowed with wheat, which had been sowed in corn stubble, about the middle of April 1916. A splendid stand of sweet clover was secured which by the 20th of August was a growth of 7 tons of green material per acre or 14,000 pounds. If we estimate the green crop to contain 75% water we have 3,500 pounds dry matter which according to the best authority contains 70 pounds of nitrogen. The 70 pounds of nitrogen when oxidsed to nitrous acid will make 235 pounds nitrous acid which if it is being produced in contact with limestone the acid will have the power to make available more than 120 pounds of lime

per acre while a corn crop yielding 100 bushels of shelled corn and 3 tons of corn stover and a half ton of cob requires only 22 pounds of lime or there is being made available about 5 times as much lime as is needed. If the nitrous acid would be produced in close proximity with the finely ground undesolved 30% phosphate rock in manure applied to soils containing lime and the bacterial life previously referred to. it would be possible at the lowest estimate for this acid to make available 62 pounds of phosphorus and 120 pounds of lime while a corn crop yielding 100 bushels shelled corn and 3 tons of stover and ½ tons of cobs per acre requires 23 pounds phosphorus and 22 pounds lime. A wheat crop yielding 50 bushels of grain and 2½ tons of straw per acre requires 16 pounds phosphorus and 11 pounds lime, while 3 tons of timothy hay per acre require 9 pounds phosphorus and 20 pounds lime. These demonstrations should be made in soils deficient in lime, that what has been said can be done in limy soils is no longer questionable, but whether it will work out as well in the Chemung soils, the Catskill, Poconos and in the Barren Shales and sandstones of the coal measures has not been demonstrated, but that it should be is only fair to farmers who have farms where these soils occur so as to make not only the limy soil fertilizer factories but all agricultural soils of the State.

A Member: Did you say that sweet clover was sowed last April?

PROF MENGES: Yes, about the 20th of April, and a spiked-tooth harrow run over the wheat and the seed covered.

A Member: And then it made that much hay?

PROF. MENGES: We didn't cut it for hay—we plowed the stuff under.

A Member: Was it on that farm below Kingston?

PROF. MENGES: It was on Mr. Etters' farm and Mr. Oscar Garber's farm. Do you know him?

A Member: No, I don't.

PROF. MENGES: Well, that was the Parker farm. I don't know it by any other name.

A Member: Is it right below New Kingston? I saw them plowing that under but I thought it was alfalfa.

PROF. MENGES: It looks very much like alfalfa.

A Member: I know what it is. I have been farming it but I never knew it to make such a growth in the first season.

PROF. MENGES: Well, you saw Garber's didn't you?

A Member: Yes, I saw that. That's why I asked when it was sowed.

PROF. MENGES: It was sowed about the 20th, sometime along the middle of April. I haven't just the exact date here.

The CHAIRMAN: Have you any other questions to ask Prof. Menges? This thing is open for discussion. Of course, the report will be accepted and adopted pretty quick, but if you have any questions, Prof. Menges can answer them now.

PROF. MENGES: I'll be glad to answer any questions along that line.

A Member: I don't know that anything of that sort has ever been reported here before. We haven't heard anything about sweet clover around this part of the country before.

PROF. MENGES: Well, this thing isn't only done with sweet clover but it is possible with all leguminous plants that thrive in this section. We can get just as good results from sowing Kentucky beans and cow peas and alfalfa and the red and the alsike clovers as we can from sweet clover, with this exception; that the sweet clover will make a larger growth under adverse conditions than any of the others, and not only that but it will grow in every section of this State. There isn't a section in which it won't thrive.

The CHAIRMAN: Will it grow along the railroad tracks?

PROF. MENGES: Yes, sir, on cinder piles.

MR. HUTCHISON: While the Prof. was reading he referred to clover growing on sour soil twice. I would like him to explain that. Now, I know you read it twice but I didn't quite get it into my head and I would like to ask you to state it again.

PROF. MENGES: The idea is this, Mr. Hutchison, that when these soils have enough available lime—I say enough available lime—the lime is taken into the plant just as is all other plant food, in solution, and when these soils have enough available lime the clovers will thrive even if the soils are sour. Now, that's a new doctrine all right.

The CHAIRMAN: If they have enough of lime, why do they sour?

PROF. MENGES: Well, that's another question. Maybe that's so. I'm not sure about that. They may have enough lime and still be sour because in the surface soil the likelihood is that the lime has probably been exhausted and if you don't dig down as I have indicated in my paper to the sub-soil, you won't get what that soil will do. When the sub soil and the surface soil are both sour then you can depend on it that clover won't thrive; but where in the limy formations that I have indicated, such as the Helderberg limestone, the Bloomsburg Red Shale, your soil up there in Huntingdon county, where you live, Mr. Hutchison, those soils when the right conditions prevail will make enough lime available for any crop, even if that surface is sour.

The CHAIRMAN: Plow deeper—is that the idea?

PROF. MENGES: Yes, and cultivate better. That's the stuff—plow deeper and cultivate better. Now the lime is derived from the organic matter that is in that soil. The crop that you plow under contains as much lime as the crop that you are raising there, and with these bacteria and the agencies of decomposition that go on in that soil, that lime is made available and is changed from the organic combination into nitrate of lime—the stuff that every agricultural plant wants. Maybe that isn't an explanation, is it, Mr. Hutchison?

MR. HUTCHISON: That's very good.

A Member: I would like to ask whether when you sow crimson clover and it freezes and the plant dies during the winter because of the cold, would it still pay to sow it?

PROF. MENGES: It depends on how much of a crop you get before it freezes. If you get only a little bit of a straggling crop it does not pay, but when your soil is covered with it, it pays well.

A Member: What would you call deep plowing?

PROF. MENGES: That depends on the soil. If I had a sandy soil I would skin it. I would not plow deep. In fact my own private opinion is that with a sandy soil the less plowiug done in it the better. Now then, another thing, in the Fall of the year I plow deep, as a general thing. Now, I include in that, plowing for wheat as well as plowing sods for corn. In the Spring of the year I would not plow deep. I would only plow about four or five inches if I could.

A Member: What's your reason for that?

PROF. MENGES: My reason for that is this—you know the organic matter, the sod that we plow down in the Fall of the year, partly decomposes or decomposition begins; whereas when we plow down a sod in the Spring of the year there is little or no decomposition started, and what we want is to keep that sod so close to the surface that the air can get in, and so that decomposition can start, and that the plant food that is contained in the organic matter that we have plowed under will be made available, so that the corn crop or the crops that we are sowing or planting the land with can get that fertility—that's my reason.

MR. SHUEY: Yes, but if you plow deep in the Spring, and don't turn it up side down the food will be down so that it will not reach the plant.

PROF. MENGES: Well, Mr. Shuey, I would prefer turning the thing down flat in the Spring.

MR. SHUEY: I never do that. I always like to plow deep first, edge it up and then work it well.

PROF. MENGES: Well probably your experience is worth more than mine. I don't know, but any way that's what I would do.

The CHAIRMAN: You harrow and then cultivate that land?

PROF. MENGES: Well don't cultivate it deep, but harrow that land up so that these foreign roots that get turned up get completely mixed with the soil and decomposition begins. You know the fertility in these sods is made available first by decomposition and then by nitrification. This nitrogen that is there we want to get made available—that's the idea I have, and when the nitrogen is made available it will make available the lime and will make available the phosphoric acid.

MR. SHOENER: I would like to ask Prof. Menges if he would turn the heavy timothy sod down flat for corn.

PROF. MENGES: Yes, sir, I would in the Spring, but in the Fall I wouldn't.

A Member: Would it not stop the roots from getting down?

PROF. MENGES: Not if you handle it right it won't. The roots of the corn plant if you don't plough so deep and you plant your corn in a furrow, the roots of that corn plant will get down through that sod at once, and when they are down underneath there they don't need the capillary water to come to the surface.

The CHAIRMAN: You don't leave a hollow there that amounts to anything, do you?

PROF. MENGES: No.

MR. KILLAM: As a member of the Credential Committee I wish to present the names from York county of the following delegates and visitors from farm organizations, and ask that they may have the privlege of the floor and the privilege of taking part in the discussions at these meetings: Mr. M. M. Snyder, D. V. Gooding, E. V. Goodling, C. F. Beck, H. W. Anderson and W. Rocky.

It was moved, seconded and carried that those gentlemen be admitted to participate in all the discussions that may come up at this meeting.

A Member: Mr. Chairman, I would like to ask that the name of Mr. L. B. Sellers, who is a representative of the New York Press, be included among those already named.

A Member: I would like to ask that George E. Shaw from Mifflin county be also included.

A Member: Mr. Chairman, I would also like to present the name of John A. Beck of Union county.

It was then moved, seconded and carried that these names be added to the list of gentlemen above named.

MR. KILLAM: I wish to present from the Secretary of the Agricultural Association of Cumberland county, who is Mr. H. J. McCreery, the name of Prof. H. A. Surface as a member of this meeting to participate in the discussions that are taking place. I don't know whether this is calculated to put him on the Board or not. There is no seal attached to it, so I can't tell. Therefore I make a motion that Prof. Surface take part in the questions and any motions.

It was then moved, seconded and carried that Prof. Surface be given the privilege of the floor and have an opportunity to take part in any of the discussions arising at this meeting.

The CHAIRMAN: If there are no more questions to ask Prof. Menges upon this soil talk, it is in order to accept his report and place it on file. Will anybody make a motion for that?

It was then moved, seconded and carried that the report of Prof. Menges be accepted and placed on file.

The CHAIRMAN: As I understand it, there is nothing back on the program. Everything is worked up until the present time. The next on the program is the Report on Forests and Forestry, by Irvin C. Williams of Harrisburg, Pa. Is Mr. Williams present?

Mr. William's report is as follows:

PENNSYLVANIA FORESTRY

By I. C. WILLIAMS, *Deputy Commissioner of Forestry.*

Forestry in Pennsylvania during the last year, in fact, the last two years, has been marked by development and management rather than by great increase in forest area. The Pennsylvania State Forests at present equal 1,012,000 acres. Only 8,000 acres were added by purchase during 1916. In development, very considerable progress has been made. To date there have been built 282 miles of new roads and 1,462 miles of old roads were repaired. There are 930 miles of fire lanes opened through the State Forest, while the total length of trails is 670 miles. The surveyed boundary lines amount to 2,217 miles, while of telephone lines there are 266 miles of metallic circuit and 36 miles of ground circuit. 100 connected telephones are in service for forest purpose. For the purpose of forest protection, there are erected 34 towers of wood, 6 of steel, and 77 tree towers, a total of 117.

The new forest protection code is giving satisfactory results: But there are still too many fires in Pennsylvania. Happily, most of them latterly have been small. Probably the State will never be able to prevent forest fires entirely. The character of our population and the diversified industries of the State, together with the numerous lines of railroad and tramways upon which coal-burning engines run to and fro, furnish conditions almost ideal for the starting of fires. The endeavor of the Department is to prevent them as far as possible and to confine them to the smallest area. Even in the great cities and towns fires occur. Here are valuable fire apparatus and trained men constantly on guard ready to respond at a minute's notice. With the most highly developed prevention and extinction systems, fires still destroy property. How much easier, therefore, it is for fires to start in the great open woodland where conditions for burning are ideal. Because of the great expanse, a fire started maliciously or accidentally may be unnoticed for a considerable time. Extinction then becomes difficult, while prevention, as an absolute fact, will probably never be realized. The one thing to do is to detect the fire in its early stage and confine it to the smallest possible area.

The foresters and their assistants have discovered, marked, and made accessible 2,250 springs, and of this number they have cleaned and walled 1,300. For the purpose of delimiting the forest areas and giving them over to intensive management, compartments are laid out. These are frequently bounded by fire lanes, so that compartment line and fire lane become one and the same. Of compartment lines proper there have been opened for use 190 miles.

To assist the Department of Fisheries in stocking streams and keeping them stocked, the Department of Forestry has planted 890,000 fish. To help the Game Commission in its work, the Department has consented to the erection of 11 game preserves within the State Forests; and in accord with the law of 1915, devotes the reasonable services of its employes to furthering the work of both these other branches of the government.

For guiding visitors into the forest and over the roads, it has erected 3,500 sign boards. For the purpose of restoring forest cover to our hills and mountains, improving water supply, preventing erosion, and producing a future timber crop, it has planted to date 22,250,000 trees, representing an area of 12,000 acres.

In the southeastern part of the State the disease known as the chestnut blight has ravaged our wild chestnuts and it is feared has killed practically the entire stand. If the trees are not yet dead, most of them are infested and likely to die. In the State Forests the trees affected are being utilized before they become valueless. Thirty-eight foresters report the disease as spreading; 4 of them report it as about stationary, while 7 report no diseased chestnuts in their region.

In order that the forest may be most useful for the purpose intended, it must be managed and improved. It must not be permitted to become too dense nor must it be allowed to go to the other extreme. Where over-density of growth is found, improvement cutting must be made. These have now been made in number 235, and the

total cash returns from such cuttings have amounted to $65,000. Other returns from the State Forests to date are $66,500, making a total of $131,500 paid into the State Treasury.

The forest nurseries in which the Department grows seedling trees for planting, cover 14 acres of bed area, while the nurseries themselves occupy much more ground. Upwards of 20,000,000 young seedlings trees are at present within State nurseries, and about half of these will be available for planting in the spring of 1917. Since the Department will be unable to plant all these because of inability to stretch the planting fund, there will be a considerable number to give away to individuals who may desire to plant new woodlots or strengthen old ones. Trees may be had for the asking.

The Pennsylvania State Forests now are and in the future will continue to be the camping and recreation grounds for our people. The total number of leased camp sites is 300, and the number of camps of all kinds last year in the forest was 1,000. Permanent camps are leased to citizens of Pennsylvania who may use them with a large degree of freedom for a small rental. Persons wishing to use the State Forests for picnic purposes or as ordinary recreation grounds, have this privilege without permit and without fee. For camping and hunting purposes, the government of Wurtemberg in Germany collects more than a half million dollars every year in the form of licenses, but the State Forests of Pennsylvania are free. The Department encourages this use and trusts that the people will avail themselves more largely of this privilege. All that is asked in return is that they obey the law and do not injure the woods.

In order that Pennsylvania may be able to do the big things in forest restoration and protection which a State of her size and wealth should do, having at least eight million acres of land suitable for nothing else but the growing of trees, the Department should be permitted to acquire within a reasonably short time at least five million acres of land to be held, developed, and managed as great State Forests. New York, by a referendum vote of the people, has just approved a new expenditure of ten millions of dollars for the purchase of additional State Forests.

A problem before the Pennsylvania farmer is better use of his least valuable land. This is usually rough or otherwise agriculturally undesirable, but still it may be made to produce a crop. No farm acre should lie idle. All land may be made to respond with that product which it is most capable of sustaining. In the case of the non-agricultural and rough farm land, a portion of it may be maintained in farm woodlot. Experience has proved that 10% of the farm area is profitably maintained in tree cover, used for woodlot purposes. Still other land thinly set with trees or without forest cover, but agriculturally unprofitable, may well be devoted to special tree crops, and among these are the nut-bearing trees. Before the advent of the chestnut bark disease we would have said chestnut. Now it is well to recommend the vigorous fruiting oaks, certain of the hickories, the black walnut, and the Persian walnut. The American people have neglected the tree nut crops. The black walnut of today is no better than it was 100 years ago. Development of tree nut crops by better breeding is in its very infancy.

The belief that the Persian walnut succeeds only in mild climates deterred its planting in this country, and, when grown from seedlings, is much too long in maturity. Grafting, budding, and hybridization are now employed with all nut-bearing trees, and the results seem to be of great promise. Ordinary mast will furnish food for swine; the improved nuts, food for the farmer and his family, and afford a considerable source of income. The culture of almonds in this country is practically unheard of, and yet there is an abundance of wild almond stock which, under cultivation and intensive methods, might well be made produce something of value.

Two problems relating to practical forestry present themselves to the people of Pennsylvania. One is the problem of floods, the other of plant and tree diseases. Yesterday the Monongahela was above the danger point. The streams of the State are at full flow. Further precipitation or 36 hours of weather above the freezing point would greatly augment the runoff. This state of affairs has been going on for years. Latterly we have waked up to the thought that something must be done about it. What is the remedy? Much of Pennsylvania's water supply passes to the ocean without having been utilized. Could it be made to enter the soil and deep strata of the earth, it would reappear as springs of permanent flow, moderating the height of flood and the depth of drought. To stop a leak, the first thought is to place an obstruction into the opening. A study of the river and flood conditions in Pennsylvania has brought the suggestion from eminent engineers that the building of great reservoirs would solve this problem. These dams are to be fitted with machinery for the generation of electric power from which great good will be derived. All this is commendable, but it does not go far enough. It fails to begin at the very root of the problem, which in this State is the absence of dense forest cover. We know that not all the denuded lands in Pennsylvania will likely be reforested, but we do know that a large proportion of them are simply barren wastes usable for no purpose. These lands ought to be carrying a tree cover. We believe that as much of the solution of the flood problem lies in adequate tree cover as in a series of great impounding dams for holding back flood waters. Investigation reveals the fact that on a watershed 50% forested, with the accompanying forest floor litter and untouched by forest fire, a rain of one inch will disappear without surface runoff; that a fully stocked forest under the same conditions will absorb a 2-inch rain without surface runoff. Four-inch rains are not the rule in this State. Therefore, from fully forested watersheds nothing should theoretically disappear in surface runoff except that above the two-inch precipitation. The planting of open places and the banks of rivers and streams with soil-holding trees, shrubs, and plants would greatly retard runoff and erosion. From a forested watershed, therefore, capable of caring for a two-inch precipitation, there should be no erosion. A minimum amount of detritus would result from runoff in excess of 2 inches. To take care of the excess a very interesting device described by Dr. J. Russell Smith in a recent magazine article is worthy of attention. It is known as the agricultural water pocket. This is nothing more than a crescent shaped depression in the hillside surrounded by a ridge of earth on the outer or lower edge, de-

signed for the purpose of holding surface water which may come down in the form of runoff. These are placed in rows and at such intervals that what escapes one will be intercepted by another. The forming of innumerable little pools thus prevents erosion and a waste by runoff. They conduct that water into the deep layers of the soil, where it becomes more or less stable soil water and elevates the water table. The water pocket seems to present itself as a useful device in the case of a forested hillside for the prevention of excess runoff. Should it conform in practice to its promise in theory, it certainly would seem possible to take care of a 4-inch precipitation.

Any forest cover saves soil by retarding runoff and changing it to underground supply. Even when the forest cover is saturated, it gives off water at a slow rate. The mechanical hindrance of the forest, plus the use of the water pocket device, ought to act in the same way as the large storage reservoir.

The engineers of the Pittsburgh Flood Commission have recommended that some 40 of these reservoirs be built. The cost will certainly be enormous, calling for probably not less than $40,000,000. With the watershed in its present uncovered and unprotected condition, erosion will continue without hindrance. There is nothing to prevent the silting up of the reservoir and rendering it useless for the purpose after a series of years. To introduce the reservoir system for the storage of surplus supply without replacing in part at least the forest cover on the watershed, will mean the adoption of extensive dredging operations or of scouring sluices almost from the very start. It is probable that this feature of the situation has not yet been much thought about. In our eagerness to control the flood problem, shall we make the mistake that the French made in Algeria, or that was made in Texas in the construction of reservoirs, only to have them filled up level and rendered useless for the purpose? In our own State, one storm is said to have brought down 40,000 cubic yards of detritus into the reservoir dams of Altoona. In the Austin, Texas, dam, the silt amounted to 968,000,000 cubic feet at the end of four years' use, and was 23 feet deep at the upper face of the dam. To be sure, silting depends upon character of soil, gradient, and volume of runoff; but even in Pennsylvania we have conditions which meet the maximum of these demands.

The Pennsylvania Department of Forestry is growing trees by the million. It gives them away for the asking. It is ready, able, and willing to assist in reforesting any denuded hillside which ought to have forest cover. It is especially anxious to replace the forest cover on the hills of western Pennsylvania, and thus assist in solving the great Pittsburgh flood problem.

The second of the two problems before the people of Pennsylvania is the menace of plant and tree diseases. How long are we as a people willing to sit down quietly and permit the ravages of tree and plant diseases to go on all around us and pay little or no attention to them or to their effects? It is only when some overwhelming calamity comes upon us that we really awake. This was true on the chestnut bark disease. Its existence was known for years before concerted effort was undertaken to investigate it adequately or do any-

thing looking toward control; but in that time the disease acquired too firm a foothold and while heroic attempts were made to solve the problem, it seems to have gone beyond our power. And yet it must not be thought that the effort to fight this destroyer of the wild chestnut tree was in vain. It called the attention of our people to this danger in a pointed and remarkable manner, and probably has made them keener and more alive to the danger of other pests than they ever were before. We are now confronted with another invader. mention of which has already been made in your presence. Shall the white pine blister be permitted to continue its ravages and destroy the white pine is the most valuable tree for reforesting in Pennsylvania. Its quick growth and valuable timber render it ideal for the purpose. It is the tree to which Pennsylvania must look in her effort to restore forest to hill and mountain and for the many wood-demanding uses of the future. Shall we give up planting white pine and let the invader go on, or shall we plant pine and fight the disease? The Department of Forestry has committed itself to the latter proposition and warfare against the disease will go on with unabated vigor. At the same time, it preaches the doctrine, plant white pine.

The CHAIRMAN: Gentlemen, you have listened to the report and paper of Mr. Williams on Forestry. Do you wish to ask any questions?

MR. KILLAM: In relation to the enemy that appears on the white pine that's recently planted, do you find it comes from the wild gooseberry plant?

MR. WILLIAMS: There is a genus of plants recognized by botanists known by the generic name of ribes, and the currant and gooseberry are species of the genus ribes. The gooseberry is a ribe, as well as the currant, the cultivated gooseberry and the cultivated currant, as well as the wild gooseberry and the wild currant are ribes. This fungus which causes the white pine blister must go from the pine to the leaves of one of these ribes. There it lives over a season and then goes back to the pine. It is one of those fungus which has a double host and cannot live unless it has ribes upon which to live. Now, all gooseberries and all currants, either wild or cultivated, come within that category. But there is one ribe more suspicious than any of the others, and that is the wild black currant, sometimes called the Missouri currant. It is frequently planted for ornamentation and produces a sweet smelling and odorous blossom in the Spring, and is followed by the black currants.

PROF. MENGES: How far do those travel?

MR. WILLIAMS: It used to be thought four or five hundred feet would furnish immunity, but recently it has been discovered in Rhode Island, that at one place on Narragansett Bay where it is ten miles wide—on the eastern side of the Bay—pines and currants were infected, and it has now appeared on the western side of the Bay. The belief is that under the conditions as they exist there, the winds carried the spores ten miles across the Bay.

DR. CONARD: Does this rust apply to any other evergreens besides the pines?

MR. WILLIAMS: Only the White Pine. I will qualify that, however, by saying only the five leaf pines. If you will look at your Scotch Pine and your Yellow Pine, you will find that they have their leaves in bundles of twos and threes. Those pines are not infected, but the Western White Pine and Hilamia Pine and our common White Pine have their leaves in bundles of five and they are all infected with this disease.

MR. COWAN: I would like to ask the speaker if he can suggest a remedy for the disease that affects the large White Pine. We have some difficulty in keeping those alive in our section, while the second growth, which is coming up on ground that hasn't been neglected, is affected by something different. The top part of the young pine seems to be stung by some animal, some insect, or something that causes their death, while the larger trees seem to wither and die as though they had been injured at the root. We have not yet been able to discover what is the cause of that. The younger pines seem to be stung, and there may be some remedy for that, but we haven't been able to find the cause of the other.

MR.WILLIAMS: May I ask what region of the State you represent?

MR. COWAN: Jefferson county.

MR. WILLIAMS: So far as the death of the large pines are concerned, from the description you give I could scarcely suggest what the trouble might be. There are a number of troubles that overcome all trees—some of them are found growing in inhospitable soil and when they reach a certain size they have exhausted the soil elements and they fail. Other fully grown pines have their leaves infected by a kind of rust that attacks the leaves and makes them brown—that's not the blister rust, remember, that's another fungus. While its not unusually regarded as serious, sometimes it so infests the tree that it almost defoliates it and the tree fails. Every particular tree failure must be studied in itself, and without being able to see your trees, I wouldn't like to venture a guess with respect to the big trees, but as to the small ones I think I know what the trouble is. It is the White Pine Weevil. The White Pine Weevil is a small insect about an eighth of an inch in length in its mature form, sometimes a little larger, and it passes to the growing tip of the young White Pine. It is most frequntly found on a growing tip, but occasionally on some of the latter branches. This little beetle lays an egg in the bark of the growing tip, which, in a little while, hatches out into a white grub. Usually the grub makes his appearance in the latter part of June and as is the case with the larva it immediately proceeds to devour a great quantity of food. This it obtains by eating its way into the center of the growing shoot to the tip, which in the case of the pine is large, and then works its way down the stem and as far as it goes, the tip with it. Now, if the next season you find the tip of a White Pine withering, take your knife and split the stem and keep on going down until you find the gentleman that is causing the trouble. So far as a remedy is concerned, the plan that is most widely adopted is cut-

ting out the infected tip or shoot, but to cut it out simply is not enough. You must take the tip with the insect in it and destroy it, burn it. When you have done that you have destroyed the trouble. Another method of keeping your pine plantation free from the weavel is to encourage the presence of birds. Almost all insectiverous birds with the possible exception of the quail and other larger birds, will pick up these black beetles, the pine weevil, and destroy them. However, there has come into this State recently, or rather it has been discovered recently, that there is a fly which preys upon the larva of the White Pine Weevil and destroys it, so when you take the tips off your trees, a good plan is not to burn them immediately because it is likely that many of these little destroying flies are there, but a better plan is to put them into a barrel, cover the top of the barrel with a piece of mosquito netting or wire, but preferably mosquito netting as the meshes in that are large enough to allow this little fly to escape, and being beneficial it ought not be destroyed, but the weevil cannot escape. In a day or two the flies will have gone out and then you can safely destroy the tip and burn the weevel.

The CHAIRMAN: Are there any other questions? We get some good information here. Have you any other questions to ask Mr. Williams about forestry?

A Member: I would like to ask you, Mr. Williams, how large these stock trees are that you set out?

MR. WILLIAMS: They are baby trees, five or six inches high and the roots are about the same length.

A Member: Would that do to put into a forest?

MR. WILLIAMS: I think so; it's the best kind of a plant. Of course, if you want to pay a dollar for a tree you can do that but you had better let us give you one and get good results rather than buy one and have it die.

A Member: I would like to ask another question in regard to transplanting those trees. What is the best time of the year to transplant?

MR. WILLIAMS: The Spring of the year is preferable to the Fall. We get better results in the Spring because the growth can go right off, and in the case of the White Pine there is a large quantity of resin in the sap of the tree. and when that hardens and comes in contact with the air and sunlight, it can never again be dissolved. So that if your planting is somewhat careless and the soil becomes warm and the air can enter in around the roots of the planted young tree, the resin in the sap will harden before growth starts and your tree will probably die; while in the Spring the growth is ready to go off immediately, even if your planting is somewhat careless.

A Member: We don't have to plant out in the field. and if we neglect furrowing the field for a few seasons they come up very thickly, but sometimes we want to transplant them where we would like to have the trees grow, and I don't know the best time to do that.

MR. WILLIAMS: You'll find if you take those little volunteer pines in the open field and transplant them when they are only a year or two old, you'll have far better success than if you let them become older. In the forest nurseries we regularly transplant them after they are two years old. That keeps the root system compact and is less of a shock to the tree than to transplant them when the roots become long.

The CHAIRMAN: How close would you plant?

MR. WILLIAMS: In forest planting we put them four by four but the degree of closeness is in accordance with the wish of the one planting. We find it is desirable to have the forest close in over the soil as quickly as possible for two reasons. The first is that thereby you prevent evaporation, and the second, you have a greater quantity of leafage constantly going into the ground to make the forest covered with mulch, and you have the trees so close together they interfere with each other, and consequently their height growth is accelerated and they grow up and have tall straight stems, whereas if you put them eight or ten feet apart they will produce large, lateral branches and sacrifices height growth.

(The Report of Sanitarian was passed in its order, but was ordered printed in the proceedings. It follows:)

REPORT OF SANITARIAN

By SAMUEL G. DIXON, M. D.

One of the most important problems we have to deal with in the safeguarding of the public health, is in keeping a constant watch over the milk supply of the people of the State in order that this product, in its many processes of collection, distribution and manufacture into butter, cheese and ice cream may be brought sweet, and clean and free from all germs of disease, to the table of the consumer. This is an arduous work and requires constant supervision in order that the best results may be achieved. "Eternal vigilance is the price of safety." The percentage of cream which is required by law is, through veterinary inspection, held as a rule up to the standard of 3.5%. But much of the sanitary supervision over the milk supply seems to stop here, and it is just from here on that this supervision must be marked with still greater vigilance if we, as servants of the people are to live up to the great responsibility vested in us of giving to them the products of the dairy, pure and uncontaminated by disease. I have, therefore, chosen this subject as the most important sanitary work you have assigned me.

The inside history of a small epidemic of typhoid fever which occurred in one of our large cities last fall due to insanitary conditions at the dairies, at the creameries and at the ice cream plant itself which used the milk and cream from these dairies and creameries in the manufacture of their products. You may then draw your own

conclusions as to whether or not the processes in the handling of milk and its products needs constant sanitary supervision from time to time it comes from the dairy cow till ingested by the consumer in the form of milk, cream, ice cream, butter and cheese.

About the middle of last August many cases of typhoid fever began to appear in one of the large cities of our State which when their histories had been taken and studied to determine the source of infection, pointed pretty clearly to the one conclusion that the typhoid infection came from eating of ice cream manufactured by one of the largest concerns in the city. Accordingly an investigation of the conditions with reference to the milk and cream used in the manufacture of ice cream by this company was ordered. The investigation involved the inspection of 1773 dairy farms of which we were able to inspect thoroughly 1675. Wrong addresses were given in many cases and certain dairymen on the list had moved away or had gone out of business by the time our insepectors got there.

Grossly insanitary conditions were found in fifty-five of these dairies—in some, the milk house was under the same roof with the pig sty, in others the cows had lain in their own manure and their flanks, sides, legs, and tails were caked with dry bovine feces, so that when the milk was drawn every up-thrust of the milker's hand would jar a shower of fecal dust into wide mouthed, unprotected, milk pail and at short intervals a larger dose was injected into the milk every time the cow swished her tail. Grooming the cows and washing their udders and bellies before milking was an unheard of thing in all these dairies, while in most of them the milker never thought of washing his hands before milking much less changing his dirty clothes to a clean suit of duck.

In none of these fifty-five dairies was there a clean floor or one that could be kept clean. Of these fifty-five dirty dairy farms there was a history of seventeen of them of typhoid fever or diarrhoeal disease within a few months to several years of the date of our inspection. On the remaining thirty-eight farms there could be obtained no history of typhoid fever, but the sanitary arrangements were disgracefully inadequate even where any semblance of such were in evidence. On each of the seventeen farms where there was a history of diarrhoeal disease Medical Inspectors obtained specimens of stools and urines of each individual suspected of being a typhoid carrier. In a number of instances they were unable to obtain specimens because the persons either refused to give them or promised to take them at some future time and send them to the Laboratory, but failed to carry out their promises. In none of the specimens sent to the Laboratory were we able to isolate any of the micro-organisms of the typhoid dysentery group.

The investigation involved the inspection of twenty-nine creameries which these various dairy farms suplied. There were insanitary conditions noted in practically every one of these and their methods of handling cream were faulty to some degree in every instance. No apparent source of typhoid infection was found in any of the creameries. It was ascertained in investigating these dairy farms and also the creameries that there had been employes working for two or three days and leaving for parts unknown. It was naturally impos-

sible to find out whether any of these irregular laborers could have been a source of infection of milk.

The inspection of the building of the Ice Cream Company showed many insanitary conditions. It is true that the front part of the building open to the public had a good appearance; but in passing from that particular part to the rear the change was shocking. Three typhoid cases appeared among the employes of the Ice Cream Company, their onset dates being Sept. 1st, 20th, and October 1st. The patient who sickened on September 1st, worked in the factory for a week or ten days before he took to his bed, having "walking typhoid" during that time and wrapping bricks of ice cream while in that condition. We believe that some of the later cases in the outbreak might be charged to this man, but so far as our being able to state definitely the source of infection of the ice cream, we are not warranted in coming to a definite conclusion. The fact remains, however, that the dairies were filthy and those handling the milk were not much cleaner.

At the beginning of the investigation, the bacteriological findings in the case of ice cream made September 16th, showed a product which was nothing short of the findings usually made in the examination of raw sewage, running a total count of from 1,000,000 to 2,500,000 colonies per cubic centimeter and an enumeration of from ten thousand to over a million colonies of colon bacilli to the cubic centimeter. As the investigation advanced and the dairies had been inspected and the manufacturer realized that a real clean-up and reformation of his processes of preparation of ice cream with which consumers were poisoned, laboratory examinations from day to day showed a gradual lessening of the number of all kinds of contaminating microorganisms with a proportionate decrease in the number of bacteria indicating pollution from intestinal sources, viz: bacillus coli, until within a week or ten days before the investigation by the Department had come to an end on the 24th of November, the total bacterial count had dropped to from 54,000 to 60,000 per cubic centimeter without the presence of a single colony of the colon bacillus.

Laboratory examination of the sour cream from several of the creameries which supplied the ice cream factory showed a total bacterial count of from 1,000,000 to 3,000,000 per c. c. with a count of from 15,000 to 750,000 B. coli—practically sewage. The cream from seven or eight creameries supplying the factory, mixed and afterward said to have been pasteurized, at first ran total counts of from one to ten million per c. c with a colon bacillus estimation of from 66 to 1,500,000. This condition was cleared up so that before the end of the investigation the mixed pasteurized cream showed a total count of 3,200 per c. c. with B. coli.

The raw cream showed up no worse than the pasteurized cream but the least that can be said is that it was none better. The raw cream from the several creameries was examined separately and with one exception a change for the better in its cleanliness was noted from one examination period to another till toward the last not an unusual total count of from 5,000 to 30,000 with no B. coli was secured in the examination of raw cream from all the creameries save one. Raw cream from this one source did not improve in quality and as a result

the Ice Cream Company refused finally to purchase cream from these filthy producers.

The butter made at this ice cream establishment was fairly good so far as bacteriological examination showed, but occasionally we would get a sample which would run from 150 to 800 colonies of B. coli per c. c. The usual examination showed a total count of 18,000 to 192,000 per c. c. with no colon bacilli. The gelatin which was used to stiffen the ice cream in its process of manufacture, at the beginning of our investigation, ran a total count of 8,000 with 200 b. coli per c. c. but latterly the usual count was 80 to 100 per c. c. and contained no colon bacilli.

Rock candy syrup and vanilla extract used in the ice cream was almost sterile while the peach and chocolate syrups contained from 5,000 to 6,000 as a total count but no B. coli.

In the examination of the gelatin, 10 grams of the gelatin was melted in 50 c. c. of warm sterile water and one c. c. of this used in the test. In the case of the butter, 25 grams was melted in 50 c. c. of warm sterile water and 1 c. c. of this used in the examination.

The outbreak involved 1,830 cases which we censored, although there were undoubtedly many more cases of which we could not get accurate records. Of these 1,830 cases, not every one is due to ice cream, but they occurred co-incident with the epidemic and in the same localities. The height of the epidemic was on the 20th of August when 135 cases sickened. 1,293 cases, or 70.6% gave a history of having eaten this ice cream. 139 gave a very likely history of having eaten it, thus we have 1,432, or 78% which may be charged up to this ice cream.

The result of this investigation makes it certain that our dairies must be kept under strict inspection. It is also true that the dairy farmer should get a better price for his products.

The CHAIRMAN: The next on our program is the Report of the Committee on Resolutions. Are they ready to report?

The Report of the Committee on Resolutions was then read and is as follows:

REPORT OF COMMITTEE ON RESOLUTIONS

Whereas, It has been brought to the attention of the State Board of Agriculture, that the Pennsylvania Railroad Company is, by means of an amendment to its tariffs applicable to bituminous and cannal coal, attempting to deprive wagon loading coal shippers from their right to sell their product in the general markets;

And, whereas, Such an amendment would, in effect, confiscate many valuable acres of coal which can be mined only on a small basis, and would be a serious blow to the economic condition of the farmers and the general public;

Therefore, be it resolved, That it is the sense of the State Board of Agriculture of Pennsylvania, assembled in Harrisburg, Pennsylvania, that such a policy of discrimination be condemned, and that

a protest against the adoption of such a rule be filed with the Public Service Commission of the Commonwealth of Pennsylvania and the Interstate Commerce Commission;

And, be it further resolved, That a copy of this resolution be filed with the Public Service Commission of the Commonwealth of Pennsylvania and the Interstate Commerce Commission.

Resolved, That we both commend and appreciate the business-like administration that is being rendered by the Hon. Charles E. Patton, Secretary of Agriculture, and recommend that the Legislature appropriate an amount of money adequate to enable him to conduct and extend the work of his several Bureaus.

Resolved, further, That the increasing demand made for Farmers' Institutes, as well as assistants from our corps of Farm Advisers, makes it imperative that more money shall be appropriated to meet these demands, and we especially urge that an increase be made in the appropriation for these great agencies in furthering agricultural interest and in rendering much needed assistance.

Resolved, That we favor and recommend that an appropriation be made to further the work of Marketing Farm Products along lines suggested by the Governor of this Commonwealth. We believe that there is no problem before the American farmer today of so great importance as that of securing better marketing facilities.

Resolved, That we recommend the repeal of the Act of 1915 creating a State Commission of Agriculture.

J. NEWTON GLOVER, Chairman,
COL. JOHN A. WOODWARD,
B. FRANK WAMBOLD,
JOHN SHOENER,
LOUIS PIOLLET,
Committee.

MR. KILLAM: I move the adoption of the resolutions.

The CHAIRMAN: The Chairman of the Committee has read these resolutions in your hearing. Are you ready to act upon them collectively?

A Member: Mr. Chairman, I would like to have the second resolution, the last resolution, read the second time, if you please. I didn't catch that.

(The second resolution was then read again).

It was then moved, seconded and carried that the report be adopted as read.

The CHAIRMAN: The next is the Report of the Legislative Committee. Is the Legislative Committee ready to report?

MR. LOHR: Mr. Chairman, I would like to state that the Chairman of the Legislative Committee, Mr. McGowan, is not present with us on account of the death of his brother and he was suddenly called home, but Mr. Rodgers will make the report. In reference to that report, Mr. McGowan has asked me to make a few remarks. You will probably recall that yesterday a bill was presented here by a Special Committee, which had been appointed, as I understand, at the last annual meeting of the State Board in this city about a year ago. That bill was reported yesterday in my absence, but the Committee had gone over the bill in conference with the Committee that framed the bill and they are of the opinion that some of the features in the bill are good, but that the bill in its entirety is too voluminous and is asking too much of a change at one time.

I am acting in lieu of the Chairman who is called home on account of sickness. I haven't made any notes, ladies and gentlemen, with regard to this report, but Mr. Rodgers has those in his possession. I want to say, in the first place, that I, for my part, don't want to enter too largely into the discussion of this proposed bill, because of the fact that I have recently been appointed Chairman of the Legislative Committee of the House, and I want to be free when the proper time comes to cast my vote and use my influence as my best judgment will predict at that time; but there has been quite a little discussion among the various members of the Committee with regard to this bill.

A Member: What is that bill?

MR. LOHR: A bill reorganizing the entire Department of Agriculture, which was read in this meeting yesterday. The bill is very long and requires about a half hour to read it, if you would read it with moderate rapidity. Now the Committee of which Mr. McGowan is Chairman, and of which I am a member, does not deem it advisable to report that bill in its entirety with an affirmative recommendation. That's the first statement—I want to make you understand that properly—and if you are not satisfied with our action on that matter, why of course, it's up to this House to act accordingly. In the second place, it is the sense of the members of that Committee that various features that are incorporated in that bill should be enacted into law and those features were brought out by Mr. Rodgers in his report. This is just a little preliminary explanation that I was asked to make by the Chairman of this Committee. That is all the report I care to make at this time. Mr. Rodgers will make the report now.

Mr. Rodgers read the report of the Legislative Committee, which is as follows:

REPORT OF THE LEGISLATIVE COMMITTEE

Your Legislative Committee beg to submit the following report:

We recommend that a Bureau of Markets be established by the present Legislature assisting in the sale of farm products.

We suggest that the Executive Committee of the State Board of Agriculture shall be substituted for the present Agricultural Commission.

That the member of the State Board of Agriculture in the various counties of the State be the Director of the Farmers' Institutes in the said counties.

We also recommend a law that will better protect the raising of sheep throughout the State.

Your Committee would further recommend the following:

That the standard of purity of the following seeds, namely medium red clover, mammoth red clover, crimson clover, alfalfa, timothy, be raised by legislative enactment from 98 per cent. pure, as the present law provides, to 99 per cent. pure.

We also recommend that the present law regulating and controlling the sale of fertilizers be so amended as to provide that the amount paid by the manufacturer to the State for the registration of the various brands will be on the tonnage basis instead of a fixed or fee basis per brand as the present law provided.

We also recommend that the above named Act be so amended as to provide that the manufacture of commercial fertilizer containing nitrogen, shall stamp upon the bag or container of such commercial fertilizer whether the said nitrogen is obtained from mineral or organic matter.

We believe that a more stringent law should be enacted for the control of noxious weeds.

Respectfully submitted,

H. G. M'GOWAN, Chairman,
ROBERT W. LOHR,
MATTHEW RODGERS,
WM. F. BECK,
Committee.

(It was then moved and seconded that the resolution as read be accepted).

MR. HUTCHISON: I move that we take this matter up and act upon every section separately. (Seconded).

The CHAIRMAN: It has been moved and seconded that we act upon each section of these resolutions separately—one at a time. Now we will take the first one.

Mr. Rodgers then read the first resolution.

(It was duly moved, seconded and carried that this resolution be adopted as read).

Mr. Rodgers then read the second resolution.

(It was duly moved, seconded and carried that this resolution be adopted as read).

Mr. Rodgers then read the third resolution.

It was then duly moved, seconded and carried that the third resolution be adopted as revised.

MR. LOHR: I don't want to be misunderstood in this matter, but I feel that probably this Special Committee who had charge of this bill that was presented here yesterday did not have a proper hearing before the house. They are dissatisfied with the findings of the Legislative Committee in this matter, and I think are of the opinion that the bill should have been recommended with certain changes, slight changes, and I was in hopes that probably the matter could be referred in some way to this House, and I would like to hear from the members of that Special Committee in this matter and also from the members of the House, without taking too much time, so that we might have an understanding.

The CHAIRMAN: Have any of the members of the Committee or the House anything to say?

MR. KILLAM: I move that the bill, the whole business, be referred to the Executive Committee who will be the Commissioners in the matter.

MR. J. ALDUS HERR: Mr. Chairman, I didn't understand the gentleman's motion.

The CHAIRMAN: Will you repeat your motion, Mr. Killam?

MR. KILLAM: I move you that the matter of legislation that was brought up yesterday be referred to the Executive Committee.

MR. J. ALDUS HERR: Do you mean the Legislative Committee or the Executive Committee?

MR. KILLAM: I mean the Executive Committee. I think that Legislative Committee has wrestled with it long enough.

MR. LOHR: I would suggest that we substitute an obituary committee instead of the Executive Committee.

The CHAIRMAN: I think we are not going to let it die just yet. I think it would be in order to have this Committee that appointed Brother Herr—and—I forget the other two members—

DR. BECK: It was the consensus of the Legislative Committee before we adjourned that we further consider that bill. It was very long and we wanted to still work at it.

MR. J. ALDUS HERR: Yesterday there was a bill presented here—or I presented the bill as Chairman of that Special Legislative Committee, and it was referred to the regular Legislative Committee, and they requested that the Special Committee confer with them, which we did, to try to explain as best we could the idea of our bill, which was somewhat lengthy, and there were certain recommendations of changes made that the regular Legislative Committee thought ought to be made. Some of the changes were sanctioned by some of the members of the Special Committee; but we as a whole, with one

exception, would like to have seen the bill adopted as it was read before the people on the floor here. And the chief objection, or the one that we couldn't agree on was section 1st, which included what qualifications a candidate should have who became a member of the State Board. That was the one that we finally agreed on after quite a good deal of discussion. And the method of his election—that was in that first section—but it was the idea and desire of the members of that Special Legislative Committee that the remainder of the bill remain as it was presented here, and it still is the desire of that Committee that that should be carried out, although it is now in the hands of the regular Legislative Committee, and we at present are at sea to know what to do; but I wanted to make myself clear. And another thing in reference to appointing an Executive Committee or the Executive Committee of the State Board being or taking the place of the Agricultural Commission—now I oppose that. I'm not the whole Committee: the rest of the Committee can speak for themselves, but I am opposed to that. I believe that that Commission should have an opportunity of more than one year to see what they can do. They have already done some good, but they should have another opportunity to see what they can still add to their usefulness. Now, that is the only explanation I have. If we have to grant the first section, the remainder of it I hope will be presented to the Legislature as we presented it to the House. I thank you for you for your attention.

MR. FENSTERMACHER: I happen to be a member of both Committees the special and the regular at present, and I want to corroborate Brother Herr in as far as he stated that he has opposed the action we have taken in making the Executive Committee take the place of the present Commission. He is correct there. He was the only one in favor of that, and there being three of us naturally he lost. I would also like to state for the benefit of Brother Killam that we have wiped out entirely the first section of our proposed bill, in which the manner and qualifications of representatives on this Board were therein incorporated. We have wiped that out entirely and made the old act chosen the same way as it was chosen heretofore, and I would beg to request Brother Killam, for the sake of the progress we have already made, small as it may be, to withdraw his motion and let this Committee work out this matter with the assistance of the Special Committee, and much good will come of it. Now, don't think this is of my own account, for we have gone to lots of labor and expense in this matter; we have had two meetings throughout the State, we have hunted up all the information we could get from this State and adjoining states. I acknowledge it is too voluminous; this bill ought to be pared down, but there has been much time and work in that thing; it covers every detail; it stops the over-lapping—everything is defined thoroughly, and it will be a nice, good, practical, workable bill. Give us a chance to work it out and pare it down. If this Board is worth existing it ought to have something to do that is worth while; it ought to have some authority, some power; it ought to be the head of agricultural interests in this State of Pennsylvania. It should not be the bob-tail of a department or anybody else in this State. Those are the senti-

ments of this Committee entirely, and we think that, in conjunction with the Secretary of Agriculture and the Governor, not denying our own powers and authority, I think we can widen out and improve this great industry in this State.

A Member: Mr. Fenstermacher, who appointed you—was it done by the Chair?

MR. FENSTERMACHER: Yes.

The CHAIRMAN: Will the Chair have the authority now to continue that Committee for another year?

MR. BLYHOLDER: My point is that there is nothing before us. The gentlemen have had the privilege to explain their action; they reported the bill and it was referred to the present Legislative Committee. They have given his information freely, and it is very satisfactory. They have progressed, and I believe the present Legislative Committee will progress. Now let us leave it in their hands, and I believe they will work out something good. So there is nothing before us. We have had the explanation of the Special Committee and that retires now and turns it over into the hands of the Legislative Committee.

The CHAIRMAN: Then you think the Special Committee is discharged?

MR. BLYHOLDER: It certainly is.

A Member: I move you that this Special Committee be continued to act in conjunction with the Legislative Committee, who has charge of this matter at the present time. Seconded.

The CHAIRMAN: It has been moved and seconded that this Special Committee be continued to act in conjunction with the Legislative Committee.

MR. SHOENER: That bill has been referred to the Legislative Committee and has not at this time been reported out by the Legislative Committee. Before any bill of that nature gets into the hands of the Legislature I think it should be reported out in this House and we have a chance to fairly and thoroughly discuss article after article and take action upon it.

MR. KILLAM: I move that the matter be continued with the Legislative Committee and that they be instructed to report at the next meeting of the State Board of Agriculture. Seconded.

MR. KILLAM: My reason for doing that is that we will probably follow that up with a motion that the State Board of Agriculture meet when the annual round-up is in June.

The CHAIRMAN: There's an amendment to the original motion to have—state it again, please.

MR. KILLAM: I move to amend that the matter be left in the hands of the Legislative Committee.

The CHAIRMAN: There's an amendment made that this matter be left in the hands of the Legislative Committee.

MR. STUDHOLME: As one of the members of the Special Committee, I would like to object to that amendment. I appreciate the courtesy of the brother here in extending the work of the Special Committee, and I would appreciate it very much if we could have that privilege of working along with the regular Legislative Committee. We feel that the work we've done on this thing in the last year should not be handed over perhaps, to another Committee, without some assistance from the Special Committee, and I am sure that the regular Legislative Committee will be in favor of this proposition of having some assistance from the Special Committee.

MR. LOHR: Mr. Chairman, I am sure that would be entirely satisfactory to me, as far as I am concerned, as a member of the present Legislative Committee, and also as a member of the Legislative Committee having charge of the matter during the past year, I feel and have felt that these men have devoted earnest thought to the preparation of this bill. I have given you the reason why we could not adopt the bill in its entirety, because I believe it would stand no chance before the Legislature. If this work can be continued with the assistance of the Special Committee I strongly advise that, because in much counsel is wisdom, and I think they should be continued.

MR. KILLAM: We don't know what's in the bill.

MR. LOHR: I beg to leave to differ with my friend. If you do not know what's in the bill, you were not present during the reading of it yesterday, and it has been in the hands of the Legislative Committee ever since, and anyone that was interested could have come there and read it over thoroughly. If you want to take that bill up now and consider it, item for item, you wouldn't get through until five o'clock or later, and this matter has already been discussed, and I think we should be ready for the motion.

COL. WOODWARD: While I am sure my friend did not intend it as such, I do feel that it would be a breach of good faith to take this matter out of the hands of the Special Committee that this Board can't afford to make.

A Member: Mr. Killam will you withdraw your amendment?

MR. KILLAM: Oh, yes.

The CHAIRMAN: Well, the original question was that this Committee of three, this Special Committee, be invited to join with the Legislative Committee in forming this bill and getting it into shape to put it before the Legislature.

It was then moved, seconded and carried that the Special Committee be continued to act in conjunction with the Legislative Committee.

The CHAIRMAN: Now, I think that's all, except the report of the Memorial Committee.

COL. WOODWARD: In the absence of our lamented friend, because of his illness, Mr. Joel A. Herr, Mr. Smith is the ranking chairman and will make the report.

MR. SMITH: In regard to this Memorial Committee, Mr. Herr, who is the Chairman of this Committee, being sick, I believe there has been no deaths during this last year, and for that reason have no report to make.

MR. KILLAM: Mr. Chairman, Mr. Kahler of Hughesville, Lycoming county, who for many years was a member of this Board, died within the last year.

The CHAIRMAN: Was he a member at the time he died?

MR. KILLAM: I don't know.

A Member: He resigned before he died.

The CHAIRMAN: Has anybody any resolution of condolence or anything to offer.

COL. WOODWARD: Neither Mr. Smith nor I had heard of any death during the year, and I didn't know who the party was that was spoken of.

The CHAIRMAN: Mr. Kahler of Hughesville. I think we will extend our sympathy to Brother Kahler's family. I don't think it is necessary to appoint a Committee to write a memorial on this, but I feel that the members of this Board who have associated with Brother Kahler for a number of years and knew him, feel disposed to offer their condolence to the family. I don't know as it is necessary to do anything more. Is there anything before this meeting? If not, it is time for it to adjourn. There is nothing more on the program, and as I understand it the next meeting of the State Board is to be held at DuBois—the meeting known as the Summer meeting or round-up.

A Member: What date?

SECRETARY PATTON: Not until the latter part of May. It was held along about 23rd, 24th or 25th last year, and that is generally about the time we have it, but if the members would like to have it a little earlier, perhaps that would be better.

The CHAIRMAN: Has it been the duty of the Secretary of Agriculture to fix the time heretofore?

SECRETARY PATTON: I am not sure about that; I think it has.

The CHAIRMAN: Well, we will leave that with you.

MR. KILLAM: I was just going to say that the latter part of May is the very worst time for us through our part of the State. Any time in June would be better, after the planting is all done, but the latter part of May we have all the planting to do, the corn, and everything.

SECRETARY PATTON: I would like to state that there is one objection to that. Your appropriation goes out of existence on the 1st of June, and if we don't use the money before the 1st of June, it goes back into the Treasury and we can't get it back again; that is the only difference. You are entitled to this money and I would like to see you get it. If you can show me any way whereby we can go over the 1st of June, I would be very glad to know it.

The CHAIRMAN: Make it the last few days of May then.

SECRETARY PATTON: Well, we will make it as late as we can and try to fix a time that will suit the most of you, and we will take the matter up with every Chairman.

It was then duly moved, seconded and carried that the date of the Spring meeting be left with the Secretary of Agriculture.

The CHAIRMAN: If there is anything more to come before this meeting we would be glad to hear it. If there is nothing further the meeting will stand adjourned.

CHARLES E. PATTON,
Secretary.

PROCEEDINGS OF JOINT MEETINGS OF THE PENNSYLVANIA STATE BOARD OF AGRICULTURE, PENNSYLVANIA BREEDERS' AND DAIRYMEN'S ASSOCIATIONS, STATE HORTICULTURAL ASSOCIATION, STATE VETERINARY MEDICAL ASSOCIATION, AND OTHER ASSOCIATIONS, HELD AT THE BOARD OF TRADE BUILDING, HARRISBURG, PA., JANUARY 23, 1917 AT 7.30 P. M. AND JANUARY 24, 1917, AT 7.30 P. M.

Harrisburg, Pa., January 23, 1917, 7.30 P. M.

Mr. W. J. Lewis, Chairman.

The CHAIRMAN: The first speaker will be Mr. Dennis, who will show some moving pictures illustrating the work of the rural schools of Pennsylvania.

Prof. Dennis spoke as follows:

RURAL COMMUNITY VOCATIONAL SCHOOLS OF PENNSYLVANIA

By PROF. L. H. DENNIS, *Director of Agricultural Education*.

Just one word by way of explanation. The moving pictures that will be thrown on the screen in about 30 seconds, illustrating the work of the rural community vocational schools of Pennsylvania, are by no means complete. It has been impossible in the time we have had at our disposal, to secure complete moving pictures; but we will be able to show you just enough to give you some idea of the practical work being carried out in the rural community vocational schools of Pennsylvania. Notice the name, rural community vocational schools in Pennsylvania. We shall, in the pictures that we shall show you, give you one phase of the work only, that is the work given to the boys. We have not had any opportunity as yet to take the moving pictures of the vocational work carried on by the girls. Just one word of explanation: In these rural community vocational schools, every boy spends one-half of his time carrying on practical work, doing things instead of studying about things. The other one-half of his time he spends in the study of regular academic subjects, high school subjects, if you wish to call it that, for the State gives liberal State aid to all communities that operate vocational schools. The State aid amounts to two-thirds of the salaries of all the vocational teachers employed by the school district, and the State gives from $900 per year to $3,600 per year to a school district for operating schools of this kind.

You may be interested to know that this is the first time a vocational school exhibit has ever been put on at any place illustrating the work done at vocational schools. The exhibit to which I refer is in the Emerson-Brantingham Building, where the big State show is being carried out. In this room tonight are 76 boys from these schools. Each school is sending a corn judging team consisting of two boys; they are here to compete in the corn judging contest tomorrow forenoon out at the State Corn Show. I am informed that every school has instructed these boys to bring home the bacon. They cannot all do that, but there is going to be keen competition. Somebody is going to win the prize. I think it is of interest to you to know that in this room now there are about 76 of these boys who have come in from all over Pennsylvania. I cannot explain things further to you, because the time allotted to me is of course very short. The speaker who follows me must get away early on account of making certain trains, and I just want to make a very brief explanation of the pictures so that you will not think for a minute that they are complete.

(The picures were then shown).

The CHAIRMAN: The next number on our program is "Orcharding and Side Lines," illustrated, by Mr. L. W. Minch, Vice-President of the New Jersey State Horticultural Society.

Mr. Minch spoke as follows:

ORCHARDING AND SIDE LINES

By L. WILLARD MINCH, *Vice President New Jersey State Horticultural Society, Bridgeton, N. J.*

Mr. Chairman, Ladies and Gentlemen: There is one thing about the speaker tonight, it don't matter when he commences, he has got to stop at a certain time, so you can be quite easy about my not talking very long. If I had the time, I would like to say some very nice things about your exhibit which I had the pleasure of examining this afternoon, and the fine quality of a great many of the horticulturists of this State and the agriculturists whom I personally know, and also pay a tribute to what we have just seen, that you are actually bringing things to pass among the young men of the State. I never have any introductions; by the way, I am just filling in now; there is this to be said, that our experiment stations and our different boards of research are doing most excellent things and we are having a wonderful lot of information given to us from various sources, and yet we feel it remained for somebody to take these facts and data and from them to work on a practical basis and make a living out of the proposition.

Now I am not here to solve the 101 difficulties about the farming proposition; I am here simply to say that I represent what is called the practical end of farming, the bread and butter of it, if you please, and while so many boards have some magnificent state endowments which allow them to do things by way of research and search after facts, for myself I have to work with one hand and keep the wolf away from the door, and search the sand with the other so as to make both ends meet in that way. So the only apology I have for appearing before you tonight is this, that we want to train our young men that there is a good living in farming, that there is something that challenges the ambition of the most worthy of our young men and women. Speaking for myself, representing as I do the sixth and seventh generations of farmers on both sides, I take great pleasure in speaking on this topic of making farming a success. My first picture happens to be the old maternal homestead, and here you have the seventh generation of my mother's side taking up the farming proposition. We have here getting a good start; well begun, you know, is half done; and here are some South Jersey young folks. I will have to hasten.

I am to talk to you on Orcharding and Side Lines. Well, as a matter of fact, I cannot tell which I am, a horticulturist or a plain farmer. I am whichever the way the money goes. The last few years we have tried to take up about 450 acres of orcharding. At the same time we have over that in what we call plain farming, and I do not know which is the better of the two propositions; they are both paying today and paying pretty well. Now we are quite heavy in what you call the onion industry in southern New Jersey. This represents a sort of natural strain of onions. Had I the time, I would like to speak to you on what is called hardy and worthy strains of home-grown seeds and bulbs. I have a great penchant for things that are accustomed to climatic conditions and I believe it is far preferable to take that which you know as being a pure strain and immune from disease rather than having an importation of any so-called nursery or horticultural stock. Here we grow the seed and then take the seed of course and sow it in this way and then we raise the sets and this represents one of the activities on the farm, keeping up, as I say, a three or four-fold proposition, growing the seeds and the sets and raising unions in the Spring. Here we are setting out the sets. That is what we call a field in most excellent tilth. We have paid great attention to the mechanical condition of this soil and you can see for yourself there that we have the proper condition for growing a crop of onions from sets. Of course we have set the onions in these indentations and pressed them firmly. In that way we can set about—I think it costs about $6.50 to set a single acre of onion sets in that fashion, no more than that. Here I have a bunch of high school boys. In the Spring of the year they come to us, the sun sort of draws them out, and Johnny lasts as long as the job does. When they are through setting onions, they return to town after getting a little bodily exercise. That represents New Jersey the last week in March. Here is growing a field of onions; we have about 65 acres annually, and you can see here we have a very mellow condition of soil. I believe the scientists would call it friable. This same field has been in onions now for, this is the sixth year.

Here, by the way, are some Kansas friends examining New Jersey and its agricultural advancement. That represents a field four years later than the picture previously taken above. We have cropped that field in succession for over six years and are planting the seventh year to set it in onions. It has been a money-maker proposition. This is the way that we cure our onions. With our light soil, the yellow and red onions, come up in the morning, we put them in bushel hampers in the afternoon and often have a sale by 9 o'clock the next morning. That is going direct to the market and you can see there it is a very rapid process; it converts onions into cash. There is a load of onions of the season of 1914; they netted us $187.50, 50 bushels on the load. They don't always do that, but they did that year, 1915. In 1915 they were about as low as they were high in 1914, but 1916 gave us good results. Now I must pass on quickly to our method of plowing. We are great fellows for deep plowing. We never plow less than 9 inches. That represents plowing up a heavy clover sod; 17 horses are employed in the operation. Here is the corn grown on that ground. This young lad is 5 feet 4 inches in height and the corn had not attained its height when the photograph was taken. This picture was taken a little later in the season; that is myself; my only apology is that I am there as a measuring stick—I stand five feet eight—to show you the height of the corn. One of the scientists said one day, "That ear is a little too high." I would rather find the ear where it ought not to be than not find any ear at all where it ought to be. When we began that farm we got about 34 bushels of shelled corn per acre, 56 pounds to the bushel. We are now getting 85 to 87 bushels on the same ground, simply by proper cultural methods and without any stable manure whatever. We are not buying New York horse manure any more, it costs too much, we don't need it. There is one hill just as I found it on that field, 3 stalks on the hill, three ears on each stalk. This is our method of utilizing the corn fodder or stover as it is often called. Of course we sell a catch crop in corn. You find here clover, rye and vetch; sometimes cow horn turnips. We use these machines in chopping up corn-stalks. In that way we get our ground full of humus. Chemical tests show that we get an abundance of potash in this fashion and get better results than we would get from 12 large loads of New York horse manure per acre, at $3 a ton. Now here is the field as it goes into Winter. You can see here some of the veetch and cowhorn turnips; see the stalk clear out; in that way we gather the snow. Our latter snows are very valuable in southern New Jersey; they do not drift and we try to have material on the ground that is rough and will enable the snow to catch and not drift all over our fields. We generally follow with tomatoes. This is a very valuable method of producing humus for tomatoes. We are very extensive growers of tomatoes. Last year we got $75 a ton, which was an exceptional price, for part of our tomatoes. Some of our fellows called them "tomartoes," but we generally call them tomatoes when we get $10 or $12 a ton. A real typical Jerseyman that don't make much out of them, calls them tomats. So it is altogether a matter of money how you pronounce them. This is a field of "Bonny Bess" just before they were ripened. They were put four feet and a half apart, and you see how they entirely covered

the ground. We got a very good crop; grew 130 acres with very good results. That represents the noon hour. The farmers accumulate during the noon hour, waiting for the buyers and shippers. After dinner it is shipped to Bridgeton. Last year 20,000 baskets were shipped. We represent the buyers for about one-half of that quantity. Here we are loading along the Tahancy River and here we are loading the barges with these tomatoes.

I haven't got time to stop on each picture, but I want to say a word or two about strawberries. This is a dandy berry, which was originally started about 7 miles from this farm. My brother and I had been able to secure as high as 10,000 quarts per acre of the Dandy berry. It is a very valuable berry to ship to long distance markets. You see we use the Patty drill and after we are through picking strawberries the second year, we gather vegetable matter and plow under. You can always grow a good crop after growing strawberries. Here we are in the strawberry field. There are some of our friends who always come to see us during strawberry time and peach time, and you good folks in Pennsylvania, I now invite you to come in strawberry time or peach time or any other time you want to come and you will always get something to eat. Here they are picking strawberries; that is what you might call direct to the consumer. (Laughter) About the only middleman concerned is somewhere about here, (indicating the stomach). It is canning on the spot, that's what it is. (Laughter) We are are always glad to have our friends visit our Gandy berries. There is a quart of Gandy berries. Now I want to say in behalf of our farmers, that we are coming to understand the wisdom of good packing. We are trying to please the eye and tickle the palate and sometimes pick the pocket, but anyhow, we have got to please the eye and tickle the palate, and people are glad to give us something by way of compensation. There were three layers in that box. This represents the top or face layer of that box of Gandy berries. Here we are showing you one of our clover fields. We are extensive growers of clover and alfalfa. This is a bunch of young ladies from Kansas out there. They don't ask "Does Kansas grow alfalfa?" But, "Does alfalfa grow Kansas?" This is one of our red clover fields that we cut once, then plow under as a vegetable material for making humus. I had Miss Hill stand by this cutting barrow, 8 foot cutting barrow, and I think I bought it from a firm in Harrisburg, we buy a lot of machinery from Harrisburg and we are very enthusiastic over these cutting barrows and we can work much better than we could with the old-fashioned four and a half or five foot cutting barrow. We are doing as much work with one good team and one machine as we formerly did with two machines.

Here we are planting alfalfa. I haven't got time to stop on that—I could talk on that 20 minutes. We have about 100 acres in alfalfa. The first thing we do, we try to get a well-drained piece of land. This follows potatoes. There is a potato right there and we very often follow potatoes with alfalfa, and we get a clean field and a well-drained field. We buy limestone from Pennsylvania, buy generally 20 cars of Pennsylvania fine ground limestone, so we are paying a pretty good tribute to you folks over in Pennsylvania. Then we are careful about our inoculation, sow the alfalfa by way of inoculation

and it gives the very best seed we can buy, and rake it in the ground and repeat the process with the roller. Here you have got the whole process, sowing the seed with alfalfa; there is the alfalfa field; we generally have what we call alfalfa day there. By the way, I heard some of you talking about Senator Topp, who stands right here. This is Prof. Agee, whom many of you in Pennsylvania. (Applause) Yes, he's all right. He has got me in a lot of trouble. I happen to be on that State Board over there and he is Secretary of the Board and makes me about as much work as any man I have ever been associated with, the only difference is that he gets $6,500 a year and I am on the Board without compensation, serving as a loyal citizen of New Jersey. Look out for these Commission Boards, boys. Anyhow, he is very good to us and is a valuable man, mixing with friends and farmers and giving instruction to the youth. And there is Mr. Jeffries and here is a visitation to one of our alfalfa fields. We like to have such days; it pays us well to stop, once in a while, in our busy work, and think about other people and other things and have a little converse together. You know when we first began to grow alfalfa we used to get the machine out and look at the clouds and wonder if it was going to rain and asked every old prophet there was, up and down the road. We don't bother that way any more; we are reasonably sure of a clear day, get out every machine we have got and go to work. We have got lots of things to do, and make it all in all, better take it all at once and have it over with rather than ask every day whether it is going to rain or not. Here we have three machines, and anyhow it doesn't matter very much after you get your alfalfa in the shocks, because, whether it rains or not, it will cure just as well. We think very much of curing alfalfa in that way.

I have some stories. but I haven't got any time to tell them. But the other day I got notice that there was a certain man that married a woman over in Pennsylvania and his mother-in-law came along with him and he was riding by this farm and his horse "cut up" a little and she got a little damaged and he served notice that he was going to bring a lawsuit against me because I had a lot of sheep hung up along the road that frightened his horse. I told him that was not the way most of our Pennsylvania friends talked and I hoped we wouldn't get any mothers-in-law from that state. There are some alfalfa roots four years old, 56 inches long, and last year we plowed up some six year old fields where the roots ran, as far as I could measure, 84 inches in length. I don't know how much further they were going. I want to say one thing in defense of my own state—don't think it is all sand over there, please. There's 56 inches before you reach much sand, and there's twice 56 before you get a real layer of sand. There is Atlantic City way down there, but that is a playground, that is what costs you fellows so much money. Some of you think that is all of New Jersey. This is what costs us money; nothing like the pet line to tie the youngsters to the farm. Here is a pet rooster; here is Ida with her dog; here is little David with his dog, and little John has got nothing else to hold, so he is holding his knees. There is the way to spend the noon hour, get acquainted with your own family and bring them in touch with the more aesthetic side of farming, and when they get older they will choose this for their vocation.

Just a word or two about our method of growing potatoes. I showed you a moment ago one of those corn fields chopped up, what was called corn stover, and here we are running this pulverizer and we are getting ready for planting potatoes. We plant about 300 acres, both early and late, generally about half and half, some in March and some in August. Here we are planting potatoes in March; there are two plows going down the side. There is the fertilizer and here is the planter. When I was a boy I had two brothers, one older and one younger than I, and the three of us planted an acre a day; this plants 8 acres a day. We do not sow our fertilizer and then plant our potatoes; we sow our fertilizer by itself, two rows, and then follow it up with this two row planter, and one man and two horses can plant 8 or 8½ acres a day. Then we cultivate potatoes sometimes before they are up. The potato bugs—it is only a question of how you handle them. One bug don't do any hurt, a dozen don't do any hurt if they are in different places, but when a dozen bugs get colonized, you have got into it, so we dis-organize the bugs; we run those cultivators up and down the rows and cover our potatoes entirely up and the bugs don't know when they are going to come up and we save many a crop of potatoes when our neighbors are injured by the early frosts.

I am very enthusiastic over early cultivation, just about the time potatoes are appearing through the ground. They are riding cultivators; that is my brother's grandson, the seventh generation of Minche's on the father's side to be farmers, and Horace Roberts, of Morristown, says he has got the set of a farmer. We hope he has, hope he will still like it. There is one row without any fertilizer. There is a field of grain that had as much stable manure as any I have ever known, but here was an accident; the machine got caught that day on one of its drills and we had no fertilizer down that row and only had a third or half a crop and not very merchantable at that. Here we are spraying. I haven't got time to stop, although I would like to, but in that way we control the blight and have no injury from bugs. The whole operation ocsts us $6.50 to $7.00 to spray for the four times. We use a power sprayer and go under the vines so well as over the vines and leave no part of the leaf untouched. I am very enthusiastic over spraying. There is a field that has been sprayed and carefully attended to. It is free of disease, as far as any blight trouble is concerned, and gave us a yield of over 100 barrels. That picture was taken the 18th of June. There is an example of rye. Here are new potatoes coming out from all these cross-rows. When we pulled out the vine, there were something like 30 small potatoes on the top of the ground. Don't allow any man to sell you seed of that small size, when they come from diseased plants. Never buy your seed of second size when they are taken from plants diseased in that fashion. I haven't got time to stop on this; I would like to; that represents a loading scene. We have one of these what we call Gordon potato-sowers; we bring them up here from the wagon and pour them in, separate the prime from the No. 2, pick out the No. 3 and the dirt and send them back. When a man buys potatoes, he don't want to buy your farm, he wants to buy potatoes separately, therefore we find it best to separate and grade our potatoes carefully like men do who grow apples. We are running them into the car.

I have had a lot of experience in shipping and have had a lot of complaints about short accounts but never any about over-accounts. I have loaded 250 cars a year, and very seldom a car but what has 2 or 3 bags claimed to be short. In this way we verify our account. There is a potato field that has got 887 baskets, 5 8 baskets, from 2½ acres, making about $1,330 out of that 2½ acres. Perhaps you have been reading of the oil wells at Millville, New Jersey; they had an awful time down there over oil. Whether they have got oil or not, I don't know, but we have got a gold mine right here in our potato field, we are sure about that, so we are not bothering about oil wells. Here is a field of onions. Here we are digging potatoes; we have got a gasoline digger and two of these four horse diggers, and as a rule the gasoline digger is laid up for repairs while the horse machine is doing the work. Here is one hill of red skinned potatoes; I dug that before witnesses and had them weighed before witnesses and they weighed over 6 pounds after they were dry. 18,000 hills on an acre and at the present day they are worth 20 cents; that one hill; that gives you $3,600 for an acre of potatoes. Never mind amout my mathematics, they are all right; the only thing is you have got to have 1,800 hills like that on the field and get the present price and you will get the result, $3.600., for every acre of potatoes. We are selling red skins today and are getting about $1.90 net to us per bushel. There is a field of clover taken this last Fall, the middle of September, planted after potatoes. I just want to show you our method, after potatoes, of sowing legumes and cover crops and here we have a field of red clover sown after potatoes, which is our best time for getting a grass crop. You can see the ground nicely covered with a solid growth of red clover.

Now I was to talk to you on orchards and side lines, but I guess the side lines have got me off; I will have to hurry. Now then, what I have shown is simply this; we lay great stress on our soil fertility; we never put in a crop until we get the ground good. We can grow anything then, most any way we want. We bought this old farm and there was a pippin tree on it 54 years old. We had it trimmed by our friends from the New Jersey Experiment Station. Near that was a tree 95 years old, but this pippin tree was 54. There is the same place next Spring; we had it trimmed and all carefully sprayed. The fence was all torn down and you can see how we revised that old orchard and are getting fine results. In fact one single tree of that pippin orchard in New Jersey grown by Mr. Mulford near Roadstown produced 35 barrels of apples in a single year, and Mr. Hale, of Connecticut, said that sounded like a big story even to him. I have known a man that picked 70 baskets just driving around under one of these trees and reaching up from the wagon. With us it is a wonderful tree. I know a tree down there 3½ feet in diameter owned by a man named Diggs; it is a natural product of southern New Jersey never found anywhere else, and shows what a tree will do if properly cared for and nourished and sprayed. Here is an old-fashioned winesap tree. This tree gave a neighbor of ours a yield for 3 or 4 years of 35 or 40 baskets on this single tree, and we got the inspiration for growing apples from seeing our neighbor picking apples from this tree. There is the same tree another year, and you know what 25 baskets of apples on an average will do for you.

There is the Buttonwood Farm, and I want to show you the belting of this farm. We bought this farm for $2,500., 58 acres of upland, and there was 14 acres that the man threw in, in meadow, said it wasn't worth much anyhow and if I would give him $2,500, I could have the farm and the whole thing put together, and I scraped up $20. to bind the bargain with and bought it. It was an old abandoned farm just south of Bridgeton, New Jersey. The old fields were good hunting grounds in the Winter and fine places to get blackberries in the Summer. We went to work pulling out the old pear trees and cleaned it up along the road. Next year we began to put out orchards and used a great deal of bone; we used bone and then we used cover crops, and if the ground was a little bit poor, we sometimes used stable manure for a starter. That shows you the farm the first year, the coming of the young orchard. Here are the teams sowing lime over the cover crop. You can see that we have had potatoes in this field; you can see the vines about here; now we are sowing lime and in that way we get magnificent results. I don't care for the lime unless we have the cover crop; that seems to work well in our soil and produce the humus material. We can get twice the growth with cover crops, with your Pennsylvania fine ground limestone. Here are the trees, intercropped with potatoes in the Fall of the year. Next Spring we began to put in rhubarb; that is always a good thing to do, but we had to have money and that farm has been paying its own expenses. We got a good crop for two years; it was remunerative and kept down the expense account. Here is a portion of the farm in Deemer pears, and I don't care what anybody says, so far as the money goes, personally I think this is a most excellent pear. Here are 47 miles of green peppers in this pear orchard, in a straight line. This shows the Buttonwood there in the distance; this is a Winter scene showing how we trimmed the trees and developed the young orchard. I haven't time to stop on that. Here we are showing the beginning of the first crop.

This is the beginning of the sixth year; the sixth year we had a pretty good crop of apples. Here is the first crop the seventh year; now we had a magnificent crop of yellow transparents that brought a good price and more than paid the expense account of the orchard in which these apples were grown; and there are the Buttonwood trees. There is the Williams Red on that same farm, the pride of the Buttonwood. That has been a very profitable apple on that farm. There are the Keifer pear trees again, showing the development of our method of trimming and the prospects of the crop for the season of 1915. There is the Williams Red apple. I left that tree; there came a rain storm the night before and you see the result, but I got the apples even on the ground. Our method is to till the land and pulverize that land and we can pick up the apples just as if they came off the trees and shipped them the same day. We count it a valuable thing to have our ground well pulverized, and we get 5 and 7 baskets off a single tree. There is one of New Jersey's bright boys, only two years old. I was out there and saw him eat the third apple. You know that old saying, "An apple a day keeps the doctor away;" I guess he is going to prolong his earthly stay quite a while, for he was packing them in that day. Here is the same orchard showing the Red

Astrichan section of that orchard. I am told that we have the largest Red Astrachan orchard in the east. It is a very valuable apple. You see the cover crop that was taken the last of September in the Red Astrachan orchard. There are the pears again; a man who grows Beaver pears will have wood whether he has pears or not. There is a Winter scene in our orchards, taken last Winter at the end of the 9th year. We had what we call an ice storm; the trees sparkled as though they had diamonds tied all over the branches. There are the cover crops. There is the beginning of a peach orchard. We began by sowing this cover crop, cow peas after potatoes. I want to show you, in a few minutes, a peach orchard of 13,000 trees. We were not quite satisfied and thought we'd better grow some peaches. Here is the peach orchard and here we are growing red potatoes in the peach trees. You see it is up almost to my waist and we got 100 barrels the first picking (and that was a dry season) due entirely I think to the growing of cow peas the year before. That gave us the humus to absorb the moisture and carried us through a very dry season. In 1914, in the Spring, we had 3 months or about 60 days without any rain and scarcely any dew, and the Fall was about as dry, yet we carried that crop through on account of using cow peas and having plenty of humus in the soil. There are pumpkins growing in your orchard. I haven't time to stop on that picture, but they make mighty good pies, I tell you that. Don't put it off too long. I have got some in the cellar now and I have my own fresh eggs. There we are growing beans the next year in this young orchard. Here we are cutting the spinnach. Our method to always keep money coming in, never have your land idle, it helps to carry the expense account.

There is the orchard in 1916, growing 13,000 trees, and we had this past year, on the 9,000 trees over here, we had about 5,000 baskets and they brought a very ready market were sold almost exclusively in the City of Bridgeton, and you know, with the incropping, that was a very paying proposition. We had onions in this section of the orchard and potatoes on the other row, so we grew something in every section of the orchard and grew the peaches on the trees at the same time. I do not know whether any of you are politicians or not, but that President, Senator Minch, I stood over there and asked him if he would hold this tree and he thought I was having my photograph taken, but I got out of it and had him in it. I put him over there to show the height of the tree. He stands 5 feet 9, so it gives you an idea of the height of the tree, and I had this young school teacher stand out there, and she stands, I think, 5 feet 5. This shows the method of dealing with the peaches around the trunk of the tree on these small branches, and you know that makes the early fruit, trim them and you get the early fruit. A miss is as good as a smile. I had this young lady stand in there and while I was not looking, she nipped that peach. That shows the champion variety, three years old, and all one tree; it gives you an idea of that young peach orchard.

Now I haven't got time to tell this story, but you know we have got a great many vacant lots in our cities. There is a lot that belongs to the Treasurer of the Cumberland Trust Company of our city; he had 3 or 4 what we called vacant building lots, and he conceived the idea of using city water for irrigation and hiring this man to grow truck

farms and I happened to see his books last Friday on those three lots. This present year he sold over $2,000 worth of vegetables, mostly in our home town. That shows what can be done on those idle lots around our cities if we have the ambition to improve them, and he has still more vegetables and celery to sell. This represents the growing of celery on Mr. Ware's vacant lots. I saw the expenses he shows that fertilizers and other expenses came to $600., which left him $1,000 for himself and the man, and then he had $400 still to divide. That is not such bad business after all, is it? Talking about this high cost of living, who is to blame for it? Some of my neighbors bother me to death about getting some of my eggs. They have got as much land around their houses as i have, but they don't want to be bothered with the pesky hens. If they don't want the bother, the only way I can do is to charge them a good price for the eggs and take the bother myself. If we had a little more ambition to improve these idle lots, I think we would grow enough to keep the people alive and reduce somewhat the cost of living and increase our profit. There is a school down in Cumberland county that I found one day when I was out riding, which represents the character of the young boys down in the lower part of our county, and I commend them to you as the coming farmers and farmers' wives of southern New Jersey, and Ithink those of us who are in this work, if we lay before these youngsters the proper inducement in the way of farming and fruit growing, we will have coming up around us an intelligent lot of young men and young women that will surely bring things to pass.

Now, I have got to go because the train has got to go, and I want to say to you folks, as I said to one of our good friends here this afternoon, "Come over to New Jersey." He says "It's so much further for us to go to New Jersey than for you to come to Pennsylvania." I said, "I can't see it." So, if any of you have any interest in southern New Jersey and have the time, just jump into your car and come down to Bridgeton, and myself and my brother will be glad to show you around. I thank you very much for your attention and certainly wish the State of Pennsylvania well. (Applause).

The CHAIRMAN: Next on the program for this evening, and this will be the last, is "Possibilities of Community Orchard Management," by A. Freeman Mason, Extension Horticulturist, of State College.

Mr. Mason then addressed the meeting as follows:

POSSIBILITIES OF COMMUNITY ORCHARD MANAGEMENT

By A. FREEMAN MASON, *Extension Horticulturist, State College, Pa.*

Gentlemen, I have a rather formidable bunch of papers here tonight which I am going to use occasionally as notes, because a good bit of the talk that I am going to give is from figures and from data in which I have to rely on notes in order to bring the material before

you. When we get to talking about the possibilities of community management, we are distinctly in a co-operative field. Every time we get to talking about co-operation, we start hammering on a subject which has been hammered on so much now that it is old stuff to a great many of the men here. In taking up the subject of community management then, if I seem to repeat what you have heard from a number of other speakers and will hear from a number of others still, why you will have to forgive me for repeating and will have to forgive them later if they take up any of the topics about which I speak.

In coming to the opportunities for community management in Pennsylvania, we are confronted with a great many different obstacles and a great many points in favor of community management as well. In the first place, day in and day out, we hear the question, "What can we do to improve Pennsylvania fruit? Why can't the ordinary farmer get as much money for his apples as he reads about the westerner getting or the big grower getting or the grower from some other section getting?" In the first place, we have one prime reason, and that is the average Pennsylvania orchard is small. They list us in the government reports as having the second largest number of apple-trees of any State in the United States; they rank Pennsylvania second; yet, going through our State, unless you confine your observations to some of the counties in the southeastern part, you wonder where Pennsylvania gets enough trees to make it rank second among the apple states. The answer is that the Pennsylvania trees are in the small farm orchard, 25, 50, 75 and 100 of them standing on the hillside or in the corner where you don't count them up in riding along on the train. The average Pennsylvania farmer cannot afford to buy equipment; he cannot afford to handle his orchards in a way that will bring him the returns that the large commercial grower can get who can afford the best equipment for orchard work.

There is another thing, too; we must take into consideration the age and size of the Pennsylvania trees. Oh, our grandfathers and great-grandfathers planted those trees; most of them got clear up out of bounds where it's hard to take care of them, where the fruit we do get has to be knocked down or shaken down. Understand I don't mean all the trees, but a large part of them on these ordinary farm orchards are such that they cannot produce good fruit economically; the age and size of the trees are against the farmer. Then another thing is the great range of varieties in the orchard. You go down to any farm orchard in Pennsylvania, and the farmer can give you an Artrachan, a Transparent, an Early Harvest, a Smokehouse, a Baldwin, a Spy, a King, occasionally a McIntosh, a Fallawater, a Russet —he can run the whole gamut in one orchard of 100 or 150 trees, so he cannot handle that large number of varieties alone and get the money out of it; he hasn't enough of one variety to demand the best market. Then there is his distance from big markets and his rather unique location in respect to the local market. Now, we have plenty of small markets around the State here that will consume tremendous quantities of fruit. Those small markets are not very particular at the present time as to the quality of the fruit they get. They do not pay a big price for any kind of fruit, because they are more or less satis-

fied with poor fruit. If he wants to tap the big market, the market that is particular about the quality and the size and the condition of the fruit, he has to ship that fruit a long distance, which, in his case, having only a small amount of fruit and a very small amount of each variety, is out of the question. So you see our Pennsylvania farmer has not an easy proposition when he gets to figuring out how he can get the prices for his fruit that the large grower does, and that the fruit grower located near the big markets and the particular markets can get.

Now, we have certain things that go to make up the ideal fruit farm. For one thing, we have to get the proper orchard unit, the proper economical unit. We have a few bulletins out on that subject, where men have taken acreages or they have even taken whole states, and have, by sending out vast numbers of personal letters and questionaires, found out just about what it is costing men to produce fruit and about what is the right number of acres to have in order to produce most economically. Most of these men will tell you that about 25 acres is the one man, one team unit. Now that works out as a unit in one other way; you get a spray outfit, a spray rig, and you can cover around 7 acres of old trees a day. Some days you will not cover that much; if you have good conditions, you will get 7 acres a day of good big old trees. While usually our spraying season lasts several days in each particular, we very seldom can count on more than between 3 and 4 days of good spraying weather at the particular time the spray should be applied, which means that with one spraying outfit a man can take care of between 20 and 25 acres, so we have a unit in that respect. So, as I say, most of these orchard economists will tell you that between 20 and 25 acres is your orchard unit. Now we have then, in order to get the proper economic unit in a community management proposition, got to get enough orchards close enough together to give us appproximately 20 acres of fruit. As long as we are working on smaller units, we cannot produce cheaply. Just compare the man with two acres and the man with 20 acres.

Take the matter of spraying; take the man with the ordinary barrel spray, with the Armstrong motor with which the man will spray, if he hasn't more than two acres of orchard. He will spend a full day spraying 2 acres of orchard, and spend a hard day. He will use one man to spray, one man to pump and mind the team, and one team. His total cost then, counting his time at 20 cents an hour and the team at $2.50 a day, if it is his own team, means that he spends $6.50 a day simply to get the spray on, besides his spraying material. His overhead expense then will be $6.50 which, on 2 acres, is $3.25 an acre. Take the same man with 20 acres, who can afford to have a power outfit which sprays 7 acres a day; he does it with one team and 3 men, which means that by adding $2. to pay for one man, he can spray 7 acres a day, making his overhead expense around $1.15 per acre. There you have a difference of $2.10 an acre for spraying overhead. I am not saying that those figures are exactly what you are paying for your spraying or what some other man is paying for

his spraying, but take it as an average, it is just about what the man is paying for his spray. That puts the cost of production at $2.15 per acre for individual spraying behind the man who has the larger acreage.

I would like to call attention to other community advantages, to the buying possibilities. The man with 2 acres cared for in the ordinary Pennsylvania style only buys a few pounds of arsenate of lead, a few gallons of lime sulphur, a few boxes—measuring them by the dozens. He pays for these our biggest retail prices. Take the matter of arsenate of lead in powdered form; if it is bought by the pound, it is 25 cents a pound; if bought by the 10 pounds, it comes down a cent; if you buy 50 pounds, it comes down another cent; if you buy 100 pounds, it comes down another cent; if you buy 300 pounds, it comes down another, so by the time you get to buying it by the 300 pound lots and up, you are paying 5 cents a pound less than the man who buys in small quantities. Dr. Fletcher, who will speak to you tomorrow morning on some orchard topics, tells us that by getting a cooper to come around and make his barrels when he has a few thousand barrels to make up, he saves 9 cents a barrel. A man on small acreage cannot buy that cheaply. Orchard machinery runs up as high as 40% in profits, as high as that, but it goes that high. For anything the man buys in small quantities he pays a high price, while in a community proposition, buying in large quantities, you save a considerable percentage on every item.

Then, we have marketing advantages. We have the advantage there of the big grower in being able to put enough fruit on the market to command a market over a fairly long period of time. When you develop a market, you want to keep your market. If you are going to supply them with fruit for a few weeks in the year, you cannot possibly hold your market. If you could command their attention right straight through the year, you can hold those people even though your prices be a little high. If you have a little fancy fruit, if you can get them in the habit of buying from you and serve them week after week right straight through, you can command a much better paying market than if you only appear before them 2 or 3 times in the year. The wide range of varieties in the ordinary orchard makes it impossible for the farmer to do that; the small amount of fruit works the same way. You lengthen the season in local markets and cut down hauling expenses by being able to haul larger quantities at longer intervals instead of having half a dozen or a dozen men hauling small quantities over the same distance and consuming the same amount of time. Another point and that is, if you are catering to the same market, community work cuts out that price-cutting competition which you find in so many cases. Take, for example, out in New Wilmington, out in New Castle. We have a number of vegetable growers around New Castle, growers who are having quite a time keeping prices up so they can make a decent interest on their investment, simply because one man will go down the street selling his stuff for such a price and the next man comes down offering his stuff at a lower price, and they get that price down and down until they won't make any money. They knew that and they got together, and now they keep an agent in Pittsburgh—I imagine we have one of the men-

bers here now who can tell you something about this later—they now keep an agent in Pittsburgh who sells the extra stuff they cannot sell at a profit on the New Castle market. That is not the only example; they are doing it in a great many other places in the State, and cutting out that price-cutting competition.

There perhaps is one feature that stands out as prominent as any, and that is uniform in standard, your grades, every grower shipping under one label and packing under one label. Every grower puts exactly the same grade of fruit on the market; there is just so much poor fruit allowed in a certain grade; his best fruit has to come up to certain standards in order to be sold as his best grade. It standardizes the grading and packing, which is one of the most important features of any kind of community work, and the feature which has made possible the great advances some of our neighbors have made in fruit growing where they are handicapped by high freight rates and high production costs and where labor is not available.

Now one more point on the advisability of the Pennsylvania farmer going into any kind of a community proposition, and that is, it frees him from orchard work when farm work demands all of his attention, which is very important. He spends more time on his general farm work than on his orchard, and this frees him just at that time to take up his farm work. Take for instance the ordinary Pennsylvania rotation: if we look at corn, corn starts in the first thing in the Spring and conflicts there with the spraying. It conflicts again if he puts on a late scale spray; it conflicts if he puts on a scab spray, and it certainly conflicts with his codling moth spray, if he puts on a 10-day spray, it certainly conflicts there; if he delays his 10-day spray until about a month after his codling moth spray, as a great many commercial growers do, he may avoid a conflict with his corn at that time, but it may damage his fruit; and then again, late in the season, it conflicts with his harvesting. Take wheat; wheat does just the same thing. We will follow with oats; oats conflict in the Spring with his plowing and sowing all the way through, the oats harvest conflicts with his third Summer spray, the spray for the second brood of codling moths that come along the latter part of July. Wheat will conflict in the middle of the Summer with the third spray; it does not conflict as much as oats and corn. Clover conflicts the least of all; it may conflict in the haying time, but all those conflict at some place and the farmer with the small, 2-acre orchard, cannot afford to waste a day from his general farm operations to take care of his orchard, because his general farm operations are by far the most important to him.

So, when some of the men in the association asked that the College look up the possibilities of community management, I began looking around the State to find a place which offered any chance for this kind of work. There seemed only a few general districts where this could be carried out, one down around Altoona, in some of those orchards in Blair county, down in Bedford county; and along the Susquehanna River, in Columbia, Luzerne, Lackawanna and Susquehanna counties, where they have a great number of small orchards, none taken care of very well, the majority not at all, and the farmers pretty well discouraged over the outlook for fruit growing. Espec-

ially was this true in Blair county and around that section, so we took one community down there located in the cove regions, one of those long, narrow valleys, or where two or three valleys come in together. The trees are planted down in the hollow, comparatively free from frost; between Martinsburg and Roaring Springs we found a straight stretch of road five miles long; on the first three miles of this road were between 15 and 20 orchardists, each one having between 50 and 250 trees; 15 of them in three miles. The distance between the first orchard after we come out of Martinsburg, and the last orchard in the group was only 2½ miles. These men were from 1 to 5 miles from Roaring Springs; they were 16 miles from Hollidaysburg, 22 miles from Altoona. They have a railway in Martinsburg. They have a quality of fruit that will not pay them to pack it up in barrels and put it on the car in barrels. If shipped at all on a train, the only way they ship it is in bulk, shovelling it in the car. To get his fruit to market then, these men haul to Hollidaysburg and Altoona, 16 and 22 miles respectively, the product of from 50 to 250 trees, their average load running around 8 loose barrels, taking him 10 to 12 hours to make the round trip and costing him around 40 cents a barrel transportation for cheap stuff in cheap packages to get to a more or less cheap market, because Altoona does not take a large quantity of fancy fruit. Ten of these men had 1,450 trees. To all 15 of the men the college sent the following letter:

State College, Pa.

Department of Agricultural Extension.

Each year the farmers of Pennsylvania waste thousands of dollars thru neglect of their orchards. The plea is made that their orchard is so small that they cannot afford to put in modern equipment or go to any other expense in caring for the trees.

The Pennsylvania State College is endeavoring to solve this problem, and at the suggestion of the secretary of the Pennsylvania Horticultural Society, is working up a scheme for community management of the neighboring orchards; that is—where one trained orchardist handles all of the orchards in the community as if they were in one big block.

A number of small orchards, comprising approximately 2,000 trees would be secured. An orchardist would assume complete control of these small orchards, buying a power sprayer, plows, cultivators, etc., sufficient to handle the whole group. He would prune, spray, cultivate, fertilize, pick, pack, and sell all of the fruit, giving to each farmer all of the money after expenses of operation were deducted. This would save the farmer himself having to work with his orchard when he wanted to plow or cultivate corn, or do other operations. Instead of several men taking numerous small loads of fruit into Altoona, one man would take a few large loads in. Glutting the market on certain days would be avoided and fruit would be had in sufficient quantities to make carload shipments in case there was more fruit than the local market could handle. All expenses would be divided up among the farmers on the basis of actual number of trees and the amount of time spent working with his fruit, the orchardist would be bounded to insure the growers, and the orchardist would keep a set of books open at all times to any of the men interested in the proposition.

The College is *not* undertaking this matter just at this time, but is merely investigating the possibility of this plan. As the district around Martinsburg offered unusual advantages for such a study, I am writing to you who are growers asking for as much information as possible. Answers to these questions in *no way binds* or *commits you* in any manner whatsoever.

Very truly yours,

A. FREEMAN MASON,
Extension Horticulturist.

Answering the questions I asked them in the questionaire which accompanied this letter would in no way bind them. I sent this questionaire and letter to each of the 15 growers and put in a self addressed, stamped envelop, returning to the college, of course. About three weeks later, having received not a single reply, I sent them another letter. Three weeks after that, having received only four replies, I sent them another letter, and a week after that, receiving no further response, I went down myself and went around through the district and talked to the farmers and got data on seven of the fifteen orchards.

Now gentlemen, the seven of the fifteen orchards revealed some very odd figures. In the first place, there were 33 different varieties named. Of the 1,450 trees, I saw growers representing 591 of thees trees, so that the 33 varieties reported were 33 out of 591 trees, and in that number there were 244 unknown trees and these unknown trees very likely had a much wider range of varieties than showed up among these 33. Among them were Baldwins, 121 trees; Northern Spy, 8, etc., with the complete list being as follows:

Baldwin,	121	Stayman Winesap,	73
Northern Spy,	8	Old Winesap,	..
Jonathan,	50	Smokehouse,	13
Rome Beauty,	23	Russetts,	1
Fallawater (or Pound),	4	Belleflower,	11
Rambo,	35	York Imperial,	32
English Rambo,	6	Ewalt,	12
Ben Davis,	10	Vandevere,	..
Black Ben (or Gano),	6	R. I. Greening,	6
Delicious,	11	Fall Pippin,	17
Wagner,	17	King David,	4
Pumpkin Sweet,	12	Maiden Blush,	21
Yellow Transparent,	8	Red Astrachan,	9
Early Harvest,	10	Unknown,	244
Grimes Golden,	10	Wealthy,	4
Pewaukee,	5	Black Twig,	20
Hubbardston,	18	King,	10
Paradise Sweet,	4		

The trees proved to be all in solid blocks; I saw blocks ranging from 50 to 250 trees, in every case in a rectangle. Part of the men had pruned; four of them had pruned; two of them had not pruned at all. Two of them did not spray at all; three of them sprayed once, and one sprayed once and occasionally oftener. The only spraying equipment was the barrel sprayer which, of course, was the only equipment that would pay on a small orchard. Occasionaly they cultivated; when they did, they cultivated in order to put in a grain crop. Occasionally they used manure and fertilizer; manure every fourth year had been the treatment of three of the men. The crop on 591 of these trees was 4,100 bushels in 1915 and 1,650 bushels last year. They ranged from three-quarters of a mile to three and one-half miles from the railroad siding. Their road was a level road, straight road. The farm work interfered in every case, except one, with the general orchard operations. I don't know how it was that that odds' man happened to handle his orchards without any interference, unless he was the one who did not spray, prune or touch his orchard. One man said that he was absolutely not interested in any kind of a proposition like this, and

the other five were skeptical as to its possibilities, and the conclusion as to the availability of that community for this kind of a proposition—you see the conclusion is distinctly negative, because, if the growers themselves are not looking for a proposition of this kind, then a co-operative effort in that community certainly will not work. So there we are with the 10 growers and 1,450 trees.

What will it cost to stage a community proposition down there? Now, in the first place, we would have to get a salaried man and put him in charge, a trained horticulturist or man of practical experience. We could not get such a man without paying $75 or more a month, because we would have to get a man that had some organizing ability; so, say we pay a man $1,000 a year; that is $82.50 a month, which we would have to pay in order to get a man who would be strong enough to hold that kind of a bunch together. For equipment we would have to have a power spray rig, discs plows, tools, wagons and other equipment to the extent of $1,125, and a packing equipment, including a shed, at a cost of $200, making $1,325 at least for equipment that he would have to have. Then his running expenses for the year taking it for granted he took 20 acres down there, just the amount these ten men had, his running expenses and the spray, $250 worth of sprays for the 20 acres, etc., making altogether $780 for his running expenses for a year, or a total of $2,950, which is $145 per acre. You can see when you talk $145 per acre to any general farmer, no matter how interested he is in his orchard, it is going to be pretty hard to convince him that you can pay out on a proposition of that sort, so it would have to be only the most enthusiastic farmers that you could get into a proposition of this sort. Now that $2,905 is $145 per acre for equipment; or, counting 30 trees to the acre, because they are planted 30 by 30, it is $4.75 a tree investment that that man would have to make in order to carry this proposition through to harvest time the first year.

Now, $1,125 of this is taken up in equipment expense which would not have to be duplicated the second year. Now the question that any financier would ask would be "Why are you charging that off the first year?" Simply because, gentlemen, in an organization of this sort, it would have to be charged up the first year because no one would dare run the risk of carrynig this expense for a long while. It would be hard to get a man to be willing to let this thing be strung out. If your orchardists went into this thing for one year with the expectation of going in for several years afterward, they might as well pay it all the first year, because then they won't have to pay it the following years. If, however, they go in the first year with the idea that if it does not work out as well as they want, they will quit, then they must certainly pay for it the first year or they won't pay for it at all. That is why we charge that equipment up the first year. The second year they only pay $1,780, or $88 an acre. $2.90 a tree for the succeeding years. Now, to pay out on this, counting the $2.90 a tree to bring the crop up to the harvest time, it means that we have to add 60 cents per barrel for harvesting because it costs about that much to pick and pack a barrel; so that we would have to get three barrels of apples per tree and sell those for $2.20 a

tree to the grower; that is, sell them in the orchard for $2.20 a tree, packed out, in order to make out the first year, paying this total amount. After substracting $1,125 for the second year, 2 barrels sold at $2.05 in the orchard would pay out, so anything above the 2 barrels per tree he averages, he would make money on. These old trees are all large, all the 25 or 50 year old kind in almost every case, solid trunks, solid in all branches, merely old, vigorous, neglected trees, A production of 4 barrels per tree would not be at all unusual if they were fertilized and cared for properly. I think any grower here with old trees, who is taking care of them would say that 4 barrels a tree would not be an unusual production if taken care of properly as outlined in the previons part of this paper. In that case, if my figures are at all correct—and I think I have allowed sufficient leeway in every case to make the figures fairly reliable—if he would average 4 barrels per tree, he would have a net profit of $2.75 per tree, selling his fruit at $2 a barrel in the orchard, or $82.50 per acre.

Now, to sum up; taking into consideration the size of the orchards down there, the size of the trees, the cost of equipping the community proposition, after the first year the men would have to get 2 barrels of fruit per tree to pay out. On these old trees, on which a production of 4 barrels per tree would not be excessive, they would make, if they sold their fruit for $2 a barrel in the orchard, they would make $2.75 per tree, which, counting 30 trees to the acre, would be $82.50 per acre. After we arrive at this figure—I want to say that this is estimated because this kind of a proposition has not been carried out yet, and only when it is carried on will we be able to tell exactly what it is going to cost to run this thing, but by allowing liberally, I think that these figures are approximately correct. But, as I say, only when we do it can we tell.

To conclude. Community propositions will only work in Pennsylvania where we have a large number of small orchards close together, where the man will have to go not more than half a mile to get from one orchard to another; only where the growers are getting such prices per bushel for their fruit that they are discouraged and feel that they cannot make money by themselves and want a proposition; only where they are so far from the market that they cannot handle their own marketing problems successfully. When we do find such a community—and we have a number of such communities, we have the communities, but not the men—we can make it successful. Now I have 15 pictures I want to throw on the screen here which will just give a rough view of the community and the work down there. There was one point I neglected to mention that was very important. I mentioned that their production this year was 4,100 barrels from the 1,450 trees, and last year it was 1,650 barrels, for this crop in Altoona they got from 28c to 60c per bushel; the lowest average of any of the growers was 28c; the highest was 60c per bushel. It cost them 40c a barrel to get it there; that is about 14c a bushel, to haul it there, aside from their other costs. Here we have one of the orchards down there in that section in leaf. He is the only man that had a picture of his orchard in leaf. You can see the size of the trees;

there is nothing special the matter with the trees except that they needed a little care; the orchard was used as a cow pasture or anything that came handy.

A Member: How tall are the trees?

MR. MASON: Those there are about 30 feet. That was a peach orchard in that same group, which does not apply to this group. The average specimen of apple that goes in from that section; fungus, scab, some scale, pretty near anything on the apple. Here we have that section. Here is Altoona, here is Hollidaysburg, Roaring Springs, and then in this section from Roaring Springs over to Martinsburg is known as the Morrison Cove district, and it is from this turn right here down to Martinsburg where that row of orchards of which I was speaking is located. This next map shows in detail the line of orchards, and here you will see the names of the owners. You will notice that the distance between these two is a quarter of a mile; here we have $\frac{1}{2}$, here $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{4}$ and $\frac{1}{2}$. Now in along here are other orchardists. There are two on this side who have only about 30 or 35 trees. There are 10 or 12 of those men whom we did not interview at all, because we were taking only those who had 50 trees and above. The total distance from the railroad siding up to H. L. Smith's four year old Stamen Winesap is $3\frac{1}{2}$ miles; from Mr. Metzger's here up to Mr. Smith's is a little less than three miles.

This shows the general view of that country. You see that you get the appearance, which is that they are down in the bottom of a hollow. You are pretty near right in drawing that conclusion. However, this Morrison's Cove has good drainage down the valley and good drainage up the valley, and somehow or other they escape frost year after year, always have a crop of very high colored fruit; they are on a moderately light soil, quite a little rock in it. I do not know the soil series; half a dozen series of soil run through that part of Blair county; I do not know whether Mr. Dunlap can help us with the soil type there or not. That was an ordinary orchard in that section. Here is one picture looking down this road which runs straight along here for three miles; it does not come out very plain; it shows the grouping there and a small orchard there and another down there. That is Hoover's orchard and there is another orchard over there. You see there is row after row of them on both sides down that road. Here we have one of Mr. Metzger's; he was the first man on that list. You can see the general style of the trees there; there are about 50 trees in that group, which runs on over here, about 5 trees further to the right, and occasionally a tree out; in a square block, easy to take care of as far as cultivation is concerned, although being isolated from other orchards, you would lose time going from one to the other. Next we have Mr. Metzger's orchard which is shown in this picture and typifies the general orchard conditions down there as well as any picture we have. Up here to the right we have a young orchard of Mr. Metzger's, which is shown in the next picture. He has 60 trees in his old orchard. Here is his young orchard, just coming on; he has about 200 trees in his young orchard. This is an individual tree in Mr. Metzger's orchard

and it is perfectly typical of the bulk of the 1,450 trees of which I spoke. You can see they are headed out there at about 6 feet; they have the lowest fruit bearing branches at just about 7 or 8 feet, and when they come down to the end, they droop down about 4 feet. You could drive a load of hay under some of the trees, but most of them are just moderately high headed trees. We would have to take some of these upper branches out and it would mean slow renovation for the first two or three years and quite a little rough pruning on these trees the first two years. On the other hand, it would reduce the fruit bearing surface on those trees a tremendous lot to prune them.

A Member: Would you cultivate the orchards?

MR. MASON: That would be a problem that would have to be worked out. Some of these orchards we would not be able to cultivate, they would have roots so near the surface that you could not do it. On the other hand, most of these orchards have been put down in grain every fourth or fifth year so that you would not run much risk if they plowed for grain frequently. This is Mr. Hoover's orchard; he has about 100 old trees and 60 of the 100 were Baldwins. All those are solid in the trunk. None of those are the hollow trees you ordinarily find when you see an old orchard like that. Most of them are very solid, very vigorous, but just uncared for. This is looking down at Mr. I. H. Paul's orchard. The valley drops into the hollow down here; the valley drops 200 feet below Paul's orchard, the floor of the valley. It is half a mile from his orchard over the mountain, drops down 200 feet in that distance. Mr. Paul has about 225 trees on his place, of which about 100 are old trees of that kind. This is Dave Mock's orchard. Dave Mock has not made any attempt to take care of his orchard and admits it. He has his fence rows running to the woodpile and everything else in there. A large number of the trees would not do very well for Mr. Mock until they have been cared for for two or three years. On the other hand, I walked through this orchard and there are only one or two trees in the orchard that had any kind of hollows in the trunks or had any big limbs that were dead. All those old limbs are alive. It means that the orchards are vigorous but uncared for. This is looking across at—well, it has gone from me now, I do not recall whose orchard that is there; it shows how they lay, one after the other, in small, square blocks of 100 trees each. Well, gentlemen, you can draw your own conclusion. You have heard mine. I was asked to discuss the community possibilities and I have done my very best on it and shown you a few typical pictures of some of the communities we have in Pennsylvania. If there are any questions or anyone has any remarks I certainly would like to hear them.

A Member: How high trees of that type do you feel that you could spray successfully?

MR. MASON: Well, the trees up around 30 feet could be brought down quite a little bit without seriously injuring the wood. Most of these trees have enough room so they have plenty of branches down

lower. You could not spray a 30 foot tree without a power sprayer—25 feet. A great many of them have the alternate bearing habit very well cultivated, or the biennial bearing habit.

A Member: That would be something to consider in your figures.

MR. MASON: Yes, it would be something to figure on, but by the application of fertilizers you would increase the yield.

A Member: Would not the old trees be just starved out?

MR. MASON: That is the trouble with a great many of them at the present time, they are just starved out for want of attention; they have borne apples in spite of the grower rather than because of him.

The meeting then adjourned.

JOINT MEETING OF ALLIED AGRICULTURAL ASSOCIATIONS

Harrisburg, Pa., January 24, 1917, 7.30 P. M.

Mr. E. S. Bayard in the Chair.

The CHAIRMAN: We are going to start the program this evening with a little picture show. It was to have been run by Mr. Bigelow, of the Philadelphia Wool and Textile Association but he has sent a substitute, Mr. Hart, who, he says, knows more about it than he does. I have the pleasure of introducing Mr. Hart. (Appaluse.)

Mr. Hart illustrated his subject and spoke as follows:

THE WOOL MANUFACTURING INDUSTRY

By MR. HART, *of Philadelphia.*

Ladies and Gentlemen: I have had this job pushed on me, but I will do the best I can. I have never seen these pictures before; I believe they have just come from Washington today, therefore I am not familiar with them. Before starting, I will make a few general remarks, that is to say, I am more familiar with the consumption of wool and the manufacture of it than the producing end which you men are connected; in other words, I don't know a whole lot about growing wool but I have had some experience with the handling and manipulating of it.

In our lives we have three important factors which are necessary to comfort or what you might term bare necessities, food, clothing and shelter. Under clothing comes wool, the most important raw material, especially in the Temperate and what you might call Frigid Zones. The value of wool as a clothing material for the colder climates is due to its property of being a non-conductor of heat. In other words, woolen fabric will keep the warmth of the body between that fabric and the body itself and only slowly pass it through to the outer air. Now the value of cotton and linen as a cool material is due to the fact that it is a good conductor of heat and will readily pass the temperature and heat of the body through to the atmosphere.

Now, as regards wool in general, Mr. Bigelow stated that our tariffs had been based upon three divisions of wool, namely: Carding wools, including the Merinos, combing wools, mostly of the British type, and carpet wools, those of native origin coming from Asia and countries which had a semi-civilization. I would also like to add a fourth division which meets the present requirements and meets the present market classification of wool and that would be this. first, Merino sheep or cross-bred sheep containing a large percentage of Merino blood; second, the British type of sheep mostly producing combing wools; third the cross-breds, and fourth carpet wools. The third or cross-bred class, nearly all of them would be combing wools. Now the fourth class would include both combing and carding wools. mostly carding. Such wools are very irregular, showing more breeding, containing a large amount of kemp and being very wasty, coarse and general, and principally used in the manufacture of carpets. The other three classes are principally used in the manufacture of clothing.

The method of manufacturing clothing, that is cloth, are those yarns which are spun on the woolen system, which is a rather short process and far less costly than the worsted system. Now, the worsted system is much more expensive and requires a greater number of processes, roughly speaking, say in the neighborhood of 16 counts or numbers of sizes, whichever you choose to call them, and, for the woolens, say roughly in the neighborhood of 5. The wools required for the worsted system are those of greater length than for the carding system, although what one manufacturer would use for a clothing wool and spin it on the woolen system, another would use on the worsted system. Our combing wools can be divided roughly into three classes according to length, and that classification is based more on the requirement and the ability of the various combs to manipulate the stock. We originally had, in the first place only the square knit comb, only capable of handling long staple wool, 8 inches or over. In the process of combing, the short fibres under the desired length, were rejected and cast aside, taking with them various vegetable matter. Only the long fibres were placed in what was known as the top and gradually reduced into a worsted thread and woven into the cloth. The woolen yarn is such that it requires shorter fibres. The position of the fibres in the thread is more of a criss-cross nature. The surface of the fibre is not clean cut, such as is found with a worsted yarn. The worsted yarn shows the fibres

parallel. That is taken care of in the worsted comb. The fibres lie parallel with one another and are what is known as equalized. The fibres are distributed so as to show a perfectly smooth, symmetrical yarn or thread. The woolen thread has a soft, spongy feeling and is placed in the goods in the filling process and the face of the goods is covered up after they are woven in the finishing process, in many cases being teazled. In the worsted goods we usually show a clear cut face, each individual thread being distinguished and the weave clear cut. Such a typical fabric would be a worsted serge, ordinary blue serge. Many of you are probably wearing such a fabric.

Getting back to the worsted comb in the three types of wool, after the Noble comb was invented, it was found that it would treat shorter staple wools and that broke down the long wools of England known as the Leicester and placed the medium or Down wools under the combing class; they became known then as half-combing wools; in other words, we then came along to probably 25 years ago when with improvements to the Noble comb, it was able to treat fibre down to $2\frac{1}{2}$ inches, and later than that, along came the adaptation of the Hyman or French comb, originally invented for combing cottons, to treat wools $2\frac{1}{2}$ inches and under in length. So today you can say that any wool even running and regular and of comparatively good fineness of staple, can be combed and the distinction between combing and carding wools has been broken down, as formerly understood. Now, there is a general distinction held today between carding and combing wools; it is a matter of difference of opinion between various men; there is no established limitation or length to divide them; it depends altogether on the requirements of the mill itself.

I will not detain you much longer, but will just say a word or two about the construction of the wool fibre, and that is this; the outer surface consists of a number of scales or serrations which give the fibre its shrinking property and also its spinning property. The middle section, which is known as the cortex or cordical layer consists of a number of elongated cells. This is what furnishes its strength and elasticity. The center of the fibre is what is known as the pith or core, the technical name being the medula. This channel is the one which furnishes the juices from the skin and glands to nourish the fibre. The nearer the wool approaches hair, the larger this central channel becomes, and the fewer the serrations or scales on the outer surface become. That is one of the chief reasons which shows you that a fine wool has greater spinning properties than a longer wool, because, generally speaking, we have a rule which states that the longer the fibre the coarser the diameter, and the shorter the fibre, the finer the diameter. Now that rule has been broken down a little by breeding, which is shown in your Delaine wools of three-quarters and full blood quality. Now then, just a word as to the breeds themselves, and then I will be ready to start. The generally accepted theory in the first place was that full blood wool came from a full blood Merino sheep, and that is true today. Three-quarters blood was supposed to come from a cross-bred sheep which contained three-fourths Merino blood, and half Merino wool from a sheep which contained half Merino blood. Those barriers have been broken down and

we find it possible to secure half blood wool from a Southdown or Dorset sheep which has never seen a Merino sheep, which is grown in the British Isles where tere are no Merino sheep, so that classification and grades today does not hold true according to the terms or names given to the cross-breeding of sheep, and they only represent today grade terms which have become generally accepted in the trade and represent the relative fineness of the various grades of wool and are only recognized as such. Those grades vary with the different sections of the country; in other words, Boston is known as the finest wool grading market in the country, and what they would term a three-eights blood wool in Boston might be known in Philadelphia as a low half blood, and so on down the line. Now, if the operator is ready and Mr. Drew will turn the lights out, we will try to start this picture.

(The moving pictures relating to the wool industry were then shown).

The CHAIRMAN: The gentleman who just spoke is a student in the textile school; he is being trained in the textile industry the same as other students are trained in agriculture. We are now going to have a free discussion, but that does not mean that you are to talk an unlimited time; I am going to ask somebody here to hold a watch, and not let anybody talk over five minutes. I had a stop watch here—it stops, and if somebody will hold this watch and tell me when the five minutes are up, I will call the man down. We have several topics for discussion; they are open to anybody; we have not appointed anybody to lead the discussion. The reason those topics are brought here is that we want a free discussion of them and want to know the ideas of the people in regard to them, and the only way we can find out is to bring them before you and let you give us your ideas. The first question before us is, "Should the State Pay Indemnity for Animals Destroyed to Prevent the Spread of Disease?" Open the ball somebody. Any cattle man in the crowd—what do you think about it? Are you all so steeped and saturated in modesty that you don't want to give your opinion? Or haven't you got any?

MR. FENSTERMACHER: I think that as long as the law is on the statute books, the tuberculin test law, which provides a certain compensation for the destruction of animals, I think we ought to be paid.

The CHAIRMAN: According to the present law?

MR. FENSTERMACHER: Yes, sir.

The CHAIRMAN: Which is $40 for grade animals and $70 for pure bred. All right. One man thinks they ought to be paid. Suppose somebody makes a motion to the effect that this body, here assembled, believes that the State should follow this policy of paying for animals according to the present law, condemned by the tuberculin test?

MR. FENSTERMACHER: I so move.

Motion seconded.

The CHAIRMAN: Now, is there any discussion?

MR. DAVIS: It seems to me that the present price guaranteed the farmer is not enough. I do not think it would be wise to say the amount that the present law indicates, because we are not getting enough. I think that every one whose cattle are condemned should be paid as near the full value as possible.

The CHAIRMAN: Suppose an animal cost $5,000 and is condemned by the tuberculin test and is slaughtered and found to be tubercular; what would you do with it?

MR. DAVIS: The average farmer does not have that kind.

The CHAIRMAN: But the State official has to pay for that kind occasionally. According to your ideas, he would have to pay that?

MR. DAVIS: No, I wouldn't say so.

The CHAIRMAN: As near as possible its full value.

MR. DAVIS: As near as possible.

The CHAIRMAN: Let us get something definite; if I didn't put the motion right, somebody put it right; should the State pay for animals condemned by the tuberculin test?

MR. DAVIS: Undoubtedly.

The CHAIRMAN: I am going to put the question pretty soon and you will have a chance to vote on it. If you want to discuss it, go ahead and discuss it.

A Member: If the State forces a law and compels the tuberculin test, the cattle should be appraised by three appraisers, the owner appoint one, the State one and these two appoint the third one.

The CHAIRMAN: Well, the State does not compel the tuberculin test.

A Member: They do in some cases.

A Member: If you want to ship from one State to another.

The CHAIRMAN: The Federal Government compels the tuberculin test, if you want to ship into another state, the other state compels it.

A Member: The State should pay full value for any animal that has got to be slaughtered on account of this tuberculin test. Looking at it from the legal point of view, it is property being condemned and being destroyed for the benefit of the State at large, therefore it should be paid for in full value; it should be paid for

in full value also because the expenses of producing milk are rapidly rising and this is putting a risk to anybody who is keeping cattle which is adding to the expense of producing milk.

MR. KIRSCH: The tuberculin cows should be destroyed as a matter of public policy, it is to the consumer's interest to have them done away with and they get it done much quicker and easier by paying for them. I think the present compensation is fair.

The CHAIRMAN: Those gentlemen said the State should pay full value; what is the full value of a tuberculous animal? How much would any of you give for it?

A Member: The full value is what it could be sold for.

The CHAIRMAN: What it could be sold for knowing it to be tubercular or knowing it to be sound? What is full value of a tubercular animal? You say the State should pay full value; what is it?

A Member: Well, that would depend on the nature of the animal.

The CHAIRMAN: It is easy to say these things, but it is hard to solve them; I am going to call on Dr. Marshall after while, and get him in a hole; I am going to put you all in a hole, if I can.

MR. JOHNSON: I think that if you were to leave that the way the gentleman states there, that it would leave too big a field for discrepancy to take place; one locality might say, "This critter is worked so much;" another locality would say not so much, and you have got yourself into a peck of trouble there at once. I think the proper thing to do is to fix an amount by statute law, as it is today. If that is not high enough, then vote upon the amount it should be, but it should be the same all over the State; otherwise you would have a lot of trouble on your hands. I think the best way is to fix the price by law and then everybody would have to come to that price.

A Member: What is that price now?

The CHAIRMAN: Forty and seventy.

A Member: That was the point I wanted to bring out, that the present price is not enough and if we fix the price at what the present law allows, it is not enough for the value of the cattle at the present time, for the price of all kinds of cattle, dairy cattle and cattle for beef purposes, has advanced so much that the present price would be inadequate.

MR. BLAIR: It should be enacted in the law a stated price not to exceed a certain amount, if the animal was worth that before it was condemned or before the test occurred; that would be the way I would value the animal, before it was condemend.

The CHAIRMAN: Mr. Blair thinks it should be paid for according to its value before it was condemned, but not to exceed a certain limit, what limit?

MR. BLAIR: Whatever is agreed upon by law.

DR. FITZPATRICK: I would like to ask you, Mr. President, how it is that we are here and who has asked us to say what any man shall be paid for his cattle?

The CHAIRMAN: You want to ask me that question? You are here, I presume, because the rest of us invited you to come and because you are behaving yourself while you are here. (Laughter).

DR. FITZPATRICK: Well then, the reason I asked that question was, a farmer who is on the place and producing cattle is not the man that is considered here. I think there should be some means of getting into communication with the men who are producing the milk or some method a vote being taken from them as to what they think of this, because I know that as $70 is concerned, I have paid almost three times that for calves only about eight weeks old. I bought them as I got them and was glad to get them.

The CHAIRMAN: The representatives of the farmers are here, Doctor.

DR. FITZPATRICK: That is a question on which we have to take a little bit of notice that somebody else has an interest in it, we have got to consider the man's money that he has invested in his stock, and $70 is not much to some but it is a lot to others, and when a man invests his money in buying a calf, he does not know and does not attempt to have it tested for tuberculosis until it is six months old; if he does, he is foolish. And how can he tell, with the surrounding conditions, that he is going to take it in, that something else is there that he has not got jurisdiction over? We want to consider this very seriously, and I, for one, think the State has a right to pay full value for every man's article because he is not going to produce a tuberculous animal. Furthermore, we have started pasteurization.

A Member: If the State sends out men to dispose of a farmer's stock, they ought to have judgment enough to tell pretty near what the animals are worth.

The CHAIRMAN: Now then, you have got this thing in this shape; some of you think you ought to pay the present appraised value; some of you think you ought to pay full value, but you do not say what full value is.

A Member: I think a set price is the right way to go about it; plenty of cattle have been condemned that are worth hundreds and there have been cattle condemned that were not worth a tenth of a hundred; why should a man who bought a cow for $10 and had her condemned, be paid $400? I think the best way is to have good, thinking people appraise them.

The CHAIRMAN: They are appraised that way; these people do not pay the limit in every case.

MR. BLACK: Do we understand that the State pays anything at this time?

The CHAIRMAN: No, the reason this question was brought up is that the State, two years ago, dropped out of paying for cattle. We had such an enormous expense on account of foot and mouth disease that the State Livestock Sanitary Board could no longer pay for cattle, and the reason this question is up tonight is that the people want to know whether the State should pay for these cattle, and, if not, why not? Why shouldn't we go ahead and pay for the cattle? Why shouldn't we appropriate money and let the State Livestock Sanitary Board pay for these cattle? We are not getting anything for cattle condemned by the tuberculin test.

A Member: Why shouldn't the State pay what they have set the price to be according to statute as well as a statute would make an individual pay state taxes?

The CHAIRMAN: The State did not make any appropriation for it, hasn't got the money; full account is being kept of these matters; the question is whether the State should resume his policy of paying for these cattle or continue on its present basis.

MR. McSPARRAN: I do not believe there is any difference of opinion among us as to the fact that the State ought to pay, but I think there has been a little wrong impression created by the requirement of the present law. Forty and seventy is simply the indemnity, but the person losing the animal has a right to all the salvage, providing the whole thing does not amount to more than nine-tenths of the appraised value of the animal, if they are not too far gone in tuberculosis so that the carcass is fit for food, you can realize $60 to $70 for a grade animal and $80 to $100 for a thoroughbred, $90 to $100 possibly. That seems to me like a fair price. The trouble is that we cannot get an appropriation to even pay that much, but it does not seem worth while for us to propose full value when we cannot get 1%, and it seems to me that the proper thing would be to accept the present law which has been passed on by the Legislature and insist that the Legislature pass the appropriation for which they have already made the statute law.

The CHAIRMAN: Now Dr. Marshall—

A Member: That gentleman speaks my feelings.

The CHAIRMAN: You think we do not need any amendment in the law?

A Member: Well, I think the State should keep up with the law that is already on the books.

The CHAIRMAN: I will say, for the veterinarians that they have kept account of all cattle and are ready, whenever the appropriation is forthcoming, to pay for all cattle that have been condemned by them. Now, Dr. Marshall, I am going to ask you to explain the situation as you see it.

DR. MARSHALL: I am very glad the President has brought this question up and I am very glad to hear the expression of opinion from the different persons who have already spoken. The question has bothered me a great deal, and I have talked with a good many men who were interested in the herds and was glad to get their opinion. I find that there is a difference of opinion even among breeders and dairymen on just what should be done. I want to talk a little about the circumstances and perhaps then you will be a little better prepared to give an opinion, and I believe that an audience of this sort is as good a jury as you can get a question of that kind before, for good, sensible solution. The last year we have tested about 17,000 cattle in Pennsylvania, and a little over 10% of them failed to pass the test. Those tests were all made at the owner's request. We have not forced the test on anybody or suggested to anybody that they have a tuberculin test. The owner would make the statement, write a letter or notify us that he had reason to believe that he was having trouble with tuberculosis in his herd and would like to know what the State could do for him to help get rid of it, or what would it advise or what should be done. In all cases we have told him that there was no money, in the first place, to pay any indemnity and we had no authority by law to make any promises that any indemnity ever would be paid. If he wanted to have the tuberculin test made, we would try and see that it was made properly, would furnish him the tuberculin, the report would have to be made to the State as required by law, and any of the animals that failed to pass the test would have to be quarantined, he could not dispose of them after they were tested and condemned, without permission from our Board; they could either be placed in quarantine or would have to be destroyed, the State commanded one of those two things. If he wanted to keep them in quarantine, he could sell the milk if he could find a place to sell it if he would guarantee that it would be properly pasteurized; and we have at the present time, I believe about 800 dairy cows quarantined producing milk that is being pasteurized and sold to people for food. If he did not want to take that course, if he did not want to quarantine them, he could not sell them without a permit and the only other alternative for him was to kill them and they had to be killed under inspection, and if the disease was not extensive or was not so extensive that the flesh was considered unfit for food, the carcass could be used for food and he would be entitled to what he could get out of the carcass, the hide, etc., and that averages about $30, I believe, in the neighborhood of $30.

That, so far, is all they have gotten out of the cattle that has been killed in the past two years. Now, we tested about 17,000, and that is more than we have tested in any one year except 1911 since we began testing for tuberculosis, about 1892; the State took it up actively in 1895 and 1911 was the high water mark; in that year we tested more cattle than we ever did in any one year besides that. At that time we were paying $70 or not to exceed $70 for a registered animal, or $40 for a non-registered animal, and the owner was entitled to the hide, offal and flesh, the same as the past year. I am surprised that there was so much testing done in the last year; I thought that when we notified a herd owner that we could not pay him any indemnity, that that would scare him out of it and he would hesitate probably about having his herd tested, but it has not had that effect.

A Member: Is that for cattle to remain in the State?

DR. MARSHALL: That is just our own native herds. It has not had the effect of stopping the people who have been in the habit of having tests made. We have tested herds this year for people who have never had them tested before. A good many, probably, are herds that have been tested from year to year.

Now I do not know just what to tell you about the indemnity proposition. If breeders are willing to take a chance at getting tuberculosis out of their herds and are so anxious to do it that they are willing to have their herds tested with no hope of getting any money—they may have some hope, but they have had no promises—if they are so anxious to get rid of the disease that they will take the chance the way they have been doing the past year, I think they are entitled to help and all the help we can give them. In asking the Legislature for money to pay indemnity for cattle, we should ask ourselves what the purpose of it is. Is that money to pay you fellows who are unfortunate something like an insurance? You have tried to use the best judgment you could in buying your cattle, and you have tried probably to keep them healthy as well as you can. You have not succeeded; you have met with bad luck; do you want the State to pay indemnity for those cattle to make up for your losses? If so, I do not think that is the entire purpose of the money that is put up by the State.

I think if the purpose is to get rid of tuberculosis, and we think we can do it, I mean if you think so and the Board thinks so and we can demonstrate it, then I think we are justified in paying indemnity and paying a pretty good one and in going after everybody and making them clean up, but I do not entertain quite so rosy ideas of getting rid of the disease as that. If you come to me and ask me if I can tell you how to get rid of tuberculosis and keep your herds free, and you say "you take full charge of it and keep this herd free and I will take my chances," I couldn't tell you whether you would lose no animals from tuberculosis this year or in the next five years, or might lose 90% of them or 50%; I couldn't make any promises. I could tell you what you would have to do; have to have your herds tested every year, take your chances on what is going to come, whether it is 1% or 90%, that is guess work on my part, you have got to take the chance. You cannot buy any cattle unless they have a tuberculin test. A man should whitewash his stables and disinfect them and leave the cattle outdoors as much as possible; there's a whole lot of things I can recommend you to do, but if you have got to depend on hired men to see that these regulations are carried out, may be you are busy and cannot get everything done that you think ought to be done and you are going to meet with disappointment when the time for the annual test comes around.

If I could tell you exactly how you could get rid of tuberculosis and keep rid of it in a sensible way and something that would surely work, or work may be 9 times out of 10, I would be in favor of telling the State to go the limit and see that you don't lose a dollar, and I believe if we would pay full value for the animals that are condemned, if we would, in addition to what the owner can get for the meat and hide, etc. say "The State will pay the difference if you will

only get rid of the tubercular cattle, I think that instead of our Board being required to test 17,000 head of cattle, we would have to test in the neighborhood of 100,000 a year. I think that the reason nine-tenths of the dairymen and breeders are hesitating about a test is because they cannot take the chance on losing so much money as they probably will if they have a tuberculin test. They are afraid of the of the test, they cannot afford the loss, now, under those conditions it might be better to wait a little bit and see if we cannot get along with a little tuberculous milk a little longer and take a chance on the disease spreading a little longer. We got along pretty fairly well up to 25 years ago and didn't know anything about tuberculosis; nobody ever bothered themselves with tuberculosis and things went on fairly well. It seems to me it is just as well, at the present time, to go a little slow, not crowd the breeders or the dairymen or insist on their having the tuberculin test, but keep figuring along with it, have the State put up enough money to experiment on it and try out the best thing we know how to do, and if sometime before we are all dead, somebody discovers the way to do it and do it surely, then go after the money and pay it out.

That is about the way I feel about handling tuberculosis. I do not think, from my point of view, that tuberculosis is an economic question. I do not think we should worry ourselves so much about the effect that milk from tubercular cattle is going to have on people who drink the milk. That milk can be cooked, it can be pasteurized, and the medical profession are not worrying themselves sick about what is going to happen from drinking milk from a cow that may have an incipient case of tuberculosis, and until there is more reason for alarm, I think it is just as well to go slow, and in reference to handling inter-state cattle, that is a little different proposition.

The State does insist on a tuberculin test on cattle brought in from another state. Sometimes I think that is going a little far, but we cannot let up entirely on inter-state cattle. Nearly every state in the Union where they buy cattle requires a tuberculin test and a physical examination, and they prescribe the plans for conducting those tests so it is pretty hard to get by them. You have got to get by a Federal inspector or some representative of the State Government, and it is not easy to deceive them; it has got to be done pretty nearly clean and pretty nearly right. If Pennsylvania would say, "We think it is all nonsense to tuberculin-test cattle and examine them physically, bring them in, we don't care whether they have tuberculosis or not," Pennsylvania would become a dumping ground for the whole United States, and the animals they could not get rid of in any other section, they would send into Pennsylvania because they would think we would not care if we did have it. I do not see any way of getting rid of fighting tuberculosis all we can on animals brought in from the outside, and I do not think it is right to pay an indemnity on those cattle; we cannot afford to pay indemnity for tuberculosis brought in from some other Commonwealth. When they get in here, if we are not satisfied with them and think they have tuberculosis and condemn them and cannot find it, then the dealer should be paid full value, but that does not happen in two cases out of a hundred. There happens to be more cases that we condemn with tuberculin

and cannot find tuberculosis in more of those animals belonging to people shipping them in from the outside than among our own individual herds. We have killed some cattle that we were not satisfied with the test and tested them and condemned them, and in about two cases out of a hundred we do not find lesions and the State cannot pay that fellow anything. I think he ought to be paid full value, all the money he lost, even if it is a $5,000 bull. If you think of paying indemnity along those lines, don't you feel that it is just as well to let the State go along a little further and test with men who are willing to take all the precautions we can think of, make the annual test once a year and re-test if necessary, and say "go ahead and help yourself, kill everything in the herd, we will take the medicine;" there are enough people in the State who are willing to take those chances, and I think that if a man is willing to go the limit, the State ought to pay him a reasonable indemnity, may be more than $70 for registered animals and more than $40 for non-registered, but I do not believe the time is ripe yet for paying that much or more for every animal that re-acts from a tuberculin test. If there are enough men in the State that are thoroughly desirous of getting rid of tuberculosis and will take the medicine we have got ready to dope out to you, I am in favor of giving you good, liberal indemnities.

DR. FITZPATRICK: I want to put myself right; the reason I say the State should pay full value is this: I know prior to the time that the indemnity law was introduced which has been stricken from the statute books of our State, which I helped to do and tried to do, because we thought that the State Livestock Board would bring about a condition such as we are here tonight talking about, and why I say that is that continuously, in my practice and in my time of going around, not alone in tuberculosis, but I have known men to buy hogs and take them to places and lose 200 or 300 of them; now, those men could not tell whether they were buying hog cholera or not. A man in the contracting business in Philadelphia had 310 horses, and out of those 310, he lost 110 with glanders, nearly $100,000 worth, and today that man is in the sanitarium.

The CHAIRMAN: I don't blame him.

DR. FITZPATRICK: That man knew nothing about horse flesh; he bought what he thought was right; he had a number of men summoned here and there and by the time that somebody caught on and recognized the disease, six clinical cases were in that farm. It is the same way with tuberculosis. I mean that when a man has bought a cow in good faith from another man and there are no apparent signs nor have there been any apparent signs of tuberculosis on the man's place—I do bar bringing them in from elsewhere—but when we have it localized in our State, it is our place to protect our citizens and their interest and it is the Livestock Board's place to do that; we have one and we should ask their assistance; a man goes out and buys his cattle and takes them home, and he wants, in all good faith, to have a herd that is free from tuberculosis. Now, the tests are made; the

man that is making them—take, for instance, men who are going on and have no idea or conception of tuberculosis—a friend of mine asked me to test his cattle; I refused; I said "I hate to do this, it will sever our friendship entirely;" he had 21 cows and 11 of them went down, and I know that since that day he and I are not friends.

Those are conditions. The man had lost money; he went into it as a matter of giving him some sustenance and putting him in business so that he would have some lay-back at a later day, but the dairy is a poor business to go into with the present conditions of this agitation. It is the man whose money is really invested—we ought to get him and get the conditions and his surroundings and how much he can afford to lose. I do not say you can take a man like Mr. Vaughan and Mr. McFadden, that could afford to lose $10,000 where another man could not afford to lose $100, I don't want to discriminate, but if you undertake this, you would have to make it equal for all.

The CHAIRMAN: There is no proposition to discriminate. Are there any other remarks on this question before I put it? The question is, "Resolved, That the State should resume the payment of indemnity for animals condemned by the tuberculin test."

MR. DERR: We kept a record of the animals condemned during the last year; we make no promises that we would pay for them, but we kept a record of the actual value of those animals and the amount the State would allow for them if they were appraised at the limit now required by law. We have actually killed nearly $90,000 worth of tuberculous animals—that is the amount that the State would have to put up now to pay for the animals we have on our records that have not been paid for, would be about $37,000, that being the limit of $40 for non-registered and $70 for registered animals. While the owners have not been made a promise that they would get a cent out of that, they do feel that they are entitled to it, and we have already asked the Legislature to give us money to pay for the animals already destroyed which amounts to about $37,000.

A Member: I was selected by the insurance company to appraise some cattle and among them was a cow that I hated to see laid out. I would have said that I didn't think she was worth anything but her hide and for dog meat. We appraised that cow at $100. The owner almost cried when we told him that we appraised the cow at $100. He said "I cannot replace that cow for $150, she is a graded cow and a wonderful producer."

The CHAIRMAN: You seem to have the idea that cattle are not appraised at the present time; they are appraised.

A Member: You asked the value of a tubercular cow.

The CHAIRMAN: Yes, but I have been able to find anybody in this State or anywhere else who could tell me what a tubercular animal is worth. Dr. Marshall has the exact figures on how many animals they tested in the past year.

A Member: Insure the cows and when they are killed let the insurance company pay for it.

The CHAIRMAN: The State Livestock Sanitary Board hasn't got the money to pay for cattle or they would pay for them.

A Member: Start an insurance company and let every stock owner insure in that.

The CHAIRMAN: Anybody can insure in an insurance company who wants to, if that company will take the risk.

DR. MARSHALL: That is the way the disease is handled in some countries. In Denmark, the farmers get up a mutual insurance association; they take care of those who are unfortunate; it doesn't come from the State or Government like it does here, and in some ways it is considered a better policy than having it put up to the State to pay it. Since I was speaking here, Dr. Bruner handed me the figures; number of cattle tested and examined physically in Pennsylvania last year, 19,244 head; number condemned, 1,996; that is 10.37%.

A Member: You asked what a tubercular animal was worth. I had two heifers condemned; I paid $125 apiece for them a few months before. They sent a doctor up from Altoona to appraise them. He wanted to give me $25 apiece for them. I said the law says $70.

The motion was then adopted.

The CHAIRMAN: The question of "Pennsylvania Dog Laws" is now before you; sail in. How are we going to do? Do we need a better dog law? If you don't want to tackle it, all right.

A Member: What is the dog law?

The CHAIRMAN: If you don't know, I haven't time to tell you; you can go up on the Hill and find out.

SENATOR STEWART: I would suggest just one thing; in constituting this body, that the members should post themselves as to what the dog law is. That, I think, is one of the troubles we have. You have been asked what the dog law is; every man here ought to know what it is.

The CHAIRMAN: That is what I told him. (Laughter) I don't think it is my business, as Chairman of this meeting, to conduct a primer class in the dog law and I am not going to do it.

A Member: We think it is.

A Member: I think there is just one thing that might be added to what dog laws we have, if they have been quoted exactly, and that is that every man should take care of his dog as he takes care of his horse. (Applause). Let every man keep his dog on his home place and when he takes him off from his place, let it be at the end of a leash only, and that will control all the dog business that needs controlling. (Applause).

The CHAIRMAN: Yes, and when we all get to be forty horse power engines we will all act that way, and not until then. We have a pretty fair dog law in Pennsylvania at the present time; the only trouble with it is this; it consists of an amendment to another law which in turn was an amendment to another law and possibly that was an amendment to another law, until it takes a Philadelphia or Somerset county lawyer to find out what the dog law is.

SENATOR STEWART: I believe it is within the intelligence of any man here to determine by careful reading, what the dog law is.

The CHAIRMAN: Do you know what it is? Go to it.

SENATOR STEWART: Do you want one dog law or two dog laws? (Laughter) We have got four dog laws on the statute books. The Chairman refused to aid you in any way whatever, and I do not propose to be your teacher tonight. I do not believe I ought to consent to tell you what the dog law is, because I have stated that it is your duty to know it yourselves.

The CHAIRMAN: I don't believe you know it either. (Laughter).

SENATOR STEWART: Everyone of you have had that opportunity, and it takes me at a disadvantage when you call on me to explain to you intelligently what the dog law is, not having read this dog law recently myself. (Laughter and applause). I want to tell you, and I will give you some of the provisions of the dog law. In the first place, every dog and his master is identified as dog and as owner, and the number of the dog and the address of the owner of the dog is published, in Greene county, in the newspapers, and the dog tax is paid when the dog is assessed, and if it is not paid, then the dog is to be killed, and I heard a man say, not long since, that we have a better class of dogs, so far, than we have ever had before under this law, (laughter) because, in one of the districts or villages in Washington county, which is my district, they killed eighty mad dogs. Those dogs went into sheep pens or buildings and killed sheep, and those fellows enforced the law and they killed eighty of them.

And there is another little law upon the statute book—you will excuse me, gentlemen, if I cannot give you all the law, but I want to say to you concerning what the President said, that you are all lawyers enough, but I say it respectfully to him, you don't need a Philadelphia lawyer to find out what this law is. There is another law that concerns and protects the sheep, and it is this, and it is a little short one, and your boys at home can understand it; that any dog found in a sheep field without the presence of his owner can be killed and there is no recourse upon the man that kills him. (Applause.) Is that severe enough?

There is one thing more I want to mention, gentlemen, and I am afraid it would not make any dog worth much, because unless I let my dog go and be around with me on the farm some, I do not think he would be of much account to me, and he is very likely to get out of my sight and get over on my neighbor's land, and I tell you the only way to remedy it is just for us to have kennel dogs and keep them kenneled at night particularly and in the daytime too, and when

you go out with your dog, keep a string on him so that you can keep him on your own farm—and what account is that kind of a dog? Well, I want to say to you, gentlemen, that I think about the best dog we have in the world is a dead dog, anyhow, particularly in a sheep district. (Laughter and applause).

A Member: I would like to say another word: There seems to be an impression that the only reason why dogs should not be allowed to run at large is the damage they do to sheep. There's a whole lot of other things they do. You take the dog that runs at large along the street and you have some favorite plant in your yard; he goes up to that plant and kills it; he can't hoist up his leg toward that plant without doing damage, and one dog makes many, and that is another very serious objection to the dog running loose, and that is another reason why they should be at the end of a leash. There's a whole lot of other things besides just the sheep business why dogs should be controlled.

The CHAIRMAN: Now the question is not why they should be controlled as how to control them. Senator Stewart told you the law as enforced by the Greene County Commissioners. He might have gone on and said that if the Greene County Commissioners did not want to put a tax on dogs, they need not. You did not seem to understand that; it is not mandatory; some counties in this State do not have any dog law because they do not put any tax on and they are not compelled to put a tax on dogs. The only reason Senator Stewart's sheep are protected is because there are enough good fellows around him that own sheep to say that that county shall license dogs, and they do impose, I believe, a $2 license; I have paid one over there.

SENATOR STEWART: It is $4 in Washington county—$2 and $4 in Washington, and $1 and $2 in our county (Greene).

The CHAIRMAN: We have a dog conference in Harrisburg and have submitted three propositions that we think ought to be incorporated into our present dog law, and the attorney-general says the present dog law, should be codified and revised and made so that somebody can understand it. The ordinary official does not know how to enforce this dog law, he has to refer to so many statutes. The first thing we propose is a minimum license fee so that every county shall tax a dog; there are several that impose no tax on dogs and a lot that impose 50 cents and do not collect that. The next thing is a kennel license to protect the man who breeds dogs and takes care of them and does not allow them to become a menace to the community; and the third provision we have suggested is that all dogs shall be restrained between sunset and sunrise. Now I would like to have your opinions on any of those points or any others.

A Member: The gentleman here spoke about license and said that every man should keep his dog at home. The Senator says that he cannot keep his dog at home. I own a dog and can take it anywhere on my place and the minute I put my foot off the place, that dog goes

home. I will give any neighbor the privilege of shooting that dog, much as I think of him, if he steps off my place. At night he is chained up. Put the license on the dog; that license tells who he belongs to; if that dog goes to a neighbor and does him damage, or don't do him damage, if he sees fit, let him kill that dog, then put a penalty on me of $25 for letting that dog go there. We have another license; a man who has a kennel pays three or four dollars; probably he may have 50 or 100 dogs; let every man with 100 dogs pay for 100 dogs; a man who goes hunting and has 100 dogs, he has to pay a license; let every man pay for the dogs he has got and keep the dogs at home.

MR. WARREN: Do you take out a hunter's license?

A Member: I don't go hunting sir; if I did, I'd pay a license.

MR. WARREN: I wish to say at this time that a man that takes a dog out at the end of a chain or rope for hunting purposes would get mighty little out of that dog. When the dog would finally jump up some kind of game, you would have to stop and loosen your dog before you got any good out of him, and if the dog is to be shot as soon as he gets away from your coat-tail, it don't look as though it's reasonable that a man should pay any license or hunting license either one. I keep my dogs for hunting purposes. While I hunt very little it is a little sport we have occasionally during the short season. We use them for that purpose. I also use them on the farm for driving stock and things of that kind, but I keep my dogs in close quarters at other times, and I am as much interested in them when they do accidentally tear loose from me as I am in a horse or cow or anything else that gets out and gets on somebody else's property. I would say now, in conclusion, that they collect the license in our county. We haven't very much indemnity to pay for damage to sheep, but they never account for the balance of the money.

The CHAIRMAN: I do not want to keep this audience here discussing matters in an unprofitable way merely for the sake of discussing them. If anyone has any other suggestions to go before our Legislators in the way of an improved dog law, I will hear them right now.

MR. MUNCE: I did think I would not get into this dog discussion, but it is of such vital importance, and I think that I was just a little afraid they might be treating it in a light and indifferent way, and the tendency of the discussion tonight has taken two or three times just a little the same turn as the getting through of a dog law has generally taken over in the House and Senate, when they get anything up in the matter of dog legislation. I was there—I believe I see a member back there who was a member of the House at the time; he introduced a law and when it came up for second reading, if you had blind-folded me, when that bill was read I would have sworn that you had led me into the dog show, the way those fellows howled and barked and yelled, etc. in the House. There's a whole lot of things connected with this that, to us people who have given it care-

ful attention, is of very great interest, and we feel that we got through some bills in the last Legislature in regard to dog legislation that we think give us the most effective and best dog law we have ever had, and it is not unreasonable.

Now, the trouble heretofore has been that there has ben a misunderstanding between us people who were classed or apparently classed as fighting the dog and those who were dog fanciers or dog lovers. Now I feel and have always felt, that a man who wants to keep a dog or dogs, he has just as good a right to keep those dogs as I have to keep sheep or horses or cattle or anything else. Now I keep sheep; I also keep two dogs; I have a collie dog and a bulldog, so that I am a dog fancier and a dog owner and pay a license for dogs, so I am not talking against either one in favor of the other, but I feel that a dog should be just like any other animal, it should be confined to a reasonable district and under reasonable rules and regulations, just the same as a bull or a boar or a stallion or anything else. Of course a man wants to go hunting, he wants to go out to hunt sometimes; I used to hunt some and if I want to go hunting I think it is my duty to arrange with my neighbor or neighbors so that I can hunt on their place; I think that is right; and then of course we have a mutual understanding. I notice down in Chester county here that they have a mutual understanding, when they want to go fox hunting, they ride through the people's grain fields and over their orchards, etc., and at the end of the season they invite the farmers and the farmer's wives and have a great big supper. That is all right, by having this mutual understanding, but what we want you to understand is this, that we are not trying to exterminate the dog, we do not want to exterminate the dog at all, but we want to have a working understanding between you people who simply keep a dog and us people who keep other stock.

Now it is not alone confined to stock, because the dog proposition has become a bigger and a broader and more important thing to be controlled and to be looked after than simply killing sheep or killing cattle. I could tell you, in my own neighborhood where a rabid dog—and I see veterinarians here who will bear me out in this—where a dog that had rabies had gone through the neighborhood on one side of me; he fought with the neighbor's dog and bit him, and in about the proper time, 9 or 10 days I believe it is, this farmer went out and found his dog after his chickens, and he went after him and the dog turned from the chickens and turned on him. It proved from the following results—that dog killed a number of his chickens; he bit four or five of his cattle, bit about a dozen hogs, and that was the result of a little cur dog that ran through the neighborhood 9 or 10 days before—went over on the other side of me—I see Mr. Carothers back there—to Mrs. Dixon's, a poor woman who was making her living out of four cows that she kept. Now that little cur dog bit those four cows and this lady went into the stable one morning to milk; her cow was acting very queerly; she thought she could quiet her and went beside her in the stall; found she was acting badly, and the cow crushed her up against the side of the stall and the result was a premature birth and she nearly lost her life. She lost every one of her cows. They were appraised and she got her

compensation. our children going to school along the streets in a town and along the roads in the country are subject to this same kind of thing; you don't know what the results may be. What we want is some regulation that those dogs can be kept the same as we keep other animals; that is all we ask for.

Now the present law, as has been explained, works out pretty good and I do not want this audience to go out and think that this is just a great big joke. This is a business proposition, and when you are talking to your legislators, if we are going to modify the law, clarify it, as the legal people tell us, if you clarify it, we want you to leave us as good a law as we have got now. It is fairly good now. In Washington county last year we killed 3,100 dogs and we did not get all of those that are roaming the country. The dogs that we killed out there were what we call tramp dogs, dogs that didn't have any owners or anybody to look after them, and, as somebody has said, we have elevated the character of the dogs in Washington county last year. At this time, when the assessors came in last year in Washington county, there were about 2,800 dogs that were refused to pay a tax on; when the assessors came in with their report, and fourteen districts to hear from; this year, at the present time, we have about 2,100 that are refused to pay tax on, and twelve districts to hear from. The result was, when we started in Washington county—I will confine myself now to the sheep damage alone—we had between $14,000 and $15,000 worth of unpaid claims for sheep, when we started to put this law into operation. At the present time we have paid off, in practically one year's operation, all that $14,000 or $15,000 worth of damage, and have between $1,200 and $1,400 in the treasury. Now of course it took some work and it is cumbersome but I believe that if you go to do anything at all with this dog law, let us do it sanely and sensibly, understanding that, at all times, a dog is property, that people who want to keep them are entitled to keep them, but let us get together and keep them the same as we keep other stock. I have no objections to your doing anything with the law. The law is very good as it is, if you enforce it, but it could be clarified, could be made better, and it is only with this in view, Mr. President, that I get before you, because we do not want to lose what we have got. You have heard today, and all through these sessions, about the importance of the sheep industry, the stock industry and all these industries, and what we want to do is to protect them and this will be one of the things and it won't injure the dog or the dog fancier or the man that wants to keep dogs.

A Member: Is this a State law or only a county law?

MR. MUNCE: It is a State law. It is up to the assessors in each county to make the levy and it is up to the Commissioners of the county to put it into execution.

A Member: The State law does not specify the amount of the tax.

MR. MUNCE: The law says you cannot exceed $2 on a male or $4 on a female; you cannot make it any amount you want to.

A Member: In our town the tax is only 50 cents on a dog.

MR. MUNCE: Last year in our county the tax on a male dog was $1.50 and on a female $3; this year, on account of the good effect of it, they have only taxed a dog $1 and a lady dog $1.50 or $2 (Laughter).

A Member: In your opinion then, the present law, if it is put in force, is making good?

MR. MUNCE: It is with us.

A Member: Then why change it, if you people in Washington county are satisfied, and I guess you are interested in sheep raising more than any other county.

MR. MUNCE: I want you men to forget the idea that a dog law is simply to protect sheep. It is not; there's horses and cows and people whose interests and lives are at stake just as much as sheep. That has been the trouble heretofore; we have fought the dog to the death and have talked about nothing but sheep.

A Member: Poultry?

MR. MUNCE: Yes, and poultry. We are making an effort to have a dog law in the State of New Jersey and in the State of West Virginia about the same as the law in Pennsylvania, so that if you are right on the line, the law will be uniform in its workings. I remember in Virginia they tell about a dog law that was being proposed over there, and they proposed that they would only allow a man to keep a dog and a bitch, and some wag got up and said "I move to amend that by allowing him to keep a dog and a bitch and a son-of-a-bitch." (Laughter).

The CHAIRMAN: Now it is getting late and I do not want to detain you any longer than necessary. This question is something that we cannot get a definite conclusion on it, I know, in an audience of this size; it is something that has to be dealt with in committees, but I do think we are trying to get out a little more definite law, one that is easier to enforce and commands the county to enforce it. If your county does not want to enforce the law, it does not need to.

A Member: They do enforce it but they do not make any return on it, they keep the money.

The CHAIRMAN: We must have a law that will be enforced in more counties. Where we have got plenty of sheep, they do enforce the law; where they don't have to enforce it, they don't. Now, it is late; let us not discuss the dog law any longer. I want to say a word about tomorrow's meetings. I believe the Horticultural Society meets in this hall tomorrow and the Breeders' and Dairymen's Association downstairs. Tomorrow's meeting will be the Milk Session; we have got representatives of the producers and the dealers and are going to turn them loose on each other and let them have it out, and the Chair will have a good-sized club and try to keep order. We would like to have something fundamental come out of this milk discussion, something more than merely the price.

A Member: I understood you, Mr. Munce, to say about these mad dogs that bite cattle—there is some arrangement, I suppose, to pay those damages; suppose they bite a person, who pays the damage?

The CHAIRMAN: The man that is bitten pays the damage, in this case.

A Member: Oh, no, the township.

The CHAIRMAN: Isn't that a matter of pure charity?

A Member: No, sir.

The CHAIRMAN: Suppose the person that was bitten was not a pauper; would that make any difference?

A Member: No.

DR. MARSHALL: The gentleman is correct.

A Member: Under the former law the county pays indemnity for horses and mules up to $100, for cattle up to $10; it has to come out of the fund raised by the taxation of dogs.

The CHAIRMAN: Do you know whether a township has to pay for anybody that is bitten?

MR. BLYHOLDER: No, the county has to pay for the treatment of animals bitten by a dog with rabies, and if the person insists, they have the privilege of claiming Pasteur treatment; that is entirely separate from our dog law; that is a county poor proposition.

The CHAIRMAN: The county pays for the Pasteur treatment?

A Member: It is not our dog law, it is a county poor proposition but it is on our statute books and in 9 cases out of 10 in this State, where we know that a person has been bitten, we refer them to the county poor district and they have them given the Pasteur treatment at the expense of the county.

MR. BLYHOLDER: The explanation given by the gentleman is just the same.

MR. MUNCE: There is no money under the sun that can pay you or me for being bitten by a rabid dog or for having any member of your family bitten. You want to keep in view the fact that we control that by the other proposition to regulate the dog the same as the other stock, because any person who has been bitten by a rabid dog, they haven't any assurance that they may not develop it sometime in the future even if they have taken the Pasteur treatment, so it goes beyond that; you cannot be paid for damage of that kind.

A Member: On behalf of the Pennsylvania State Chamber of Commerce I simply wish to make the announcement that there has been organized in Pennsylvania a State Chamber of Commerce which is designed to take in all organizations, organizations similar to these

represented here tonight, and if you wish to get an expression of opinion of every city, every industrial and commercial organization in the State and every farming organization on the payment of a refund to the farmer for loss of cows by reason of the tuberculin test or any other proposition, this new Chamber has the machinery to take the vote, and I will be glad to see any of you at any time.

After other meetings had been announced, the session adjourned.